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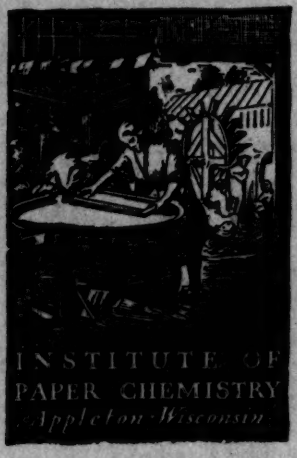
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



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OCTOBER · 1952

Volume 23 Number 2

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Books and Pamphlets Added to the Library During September

ALKALINE PROCESSES

MATHIESEN, EINAR. Sulfatcellulose og kraftpapir. Fredrikstad, A. S. Østbergs Trykkeri og Bokbinderi, 1951. 155 p.

BIOLOGICAL CHEMISTRY

MINNESOTA UNIVERSITY. *Division of Agricultural Biochemistry.* Collected research papers, numbers 812-852. Volume 16, 1950-1951. St. Paul, Minnesota Agricultural Experiment Station, 1952. Reprints with various pagings.

CHEMISTRY—YEARBOOKS

SOCIETY OF CHEMICAL INDUSTRY. Reports on the progress of applied chemistry. London, The Society [1952] v. 36, 1951. 878 p.

CHEMISTRY, ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilsteins Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-1929 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer Verlag, 1952. 18. Band. 620 p.

CHEMISTRY, PHYSICAL AND THEORETICAL

ANNUAL REVIEW OF PHYSICAL CHEMISTRY. G. K. Rollefson, editor; R. E. Powell, associate editor. Stanford, Annual Reviews, Inc., 1952. v. 3. 416 p.

ECONOMICS

STUDY GROUP ON BUSINESS INCOME. Changing concepts of business income. New York, Macmillan, 1952. 160 p.

ENGINEERING

ESHBACH, OVID W., ed. Handbook of engineering fundamentals. Prepared by a staff of specialists. 2d ed. New York, Wiley [c1952] Various paging.

FLUID MECHANICS

DODGE, RUSSELL A., and THOMPSON, MILTON J. Fluid mechanics. New York, McGraw-Hill Book Co., 1937. 495 p.

LAPPLE, C. E. *and others.* Fluid and particle mechanics; based on a graduate chemical engineering course given at the University of Delaware. Newark, Del., The University, 1951. 353 p.

VENNARD, JOHN K. Elementary fluid mechanics. 2d ed. New York, Wiley [c1947; 8th printing, 1951] 339 p.

FRENCH LANGUAGE

DE VRIES, LOUIS. French-English science dictionary for students in agricultural, biological, and physical sciences, with a supplement of terms in aeronautics, electronics, radar, radio, television. 2d ed. New York, McGraw-Hill Book Co., 1951. 596 p.

GLUCURONIC ACID

ARTZ, NEAL E., and OSMAN, ELIZABETH M. Biochemistry of glucuronic acid. New York, Academic Press, 1950. 103 p.

INSECTS, INJURIOUS AND BENEFICIAL

GREAT BRITAIN. *Department of Scientific and Industrial Research. Pest Infestation Research Board.* Report . . . with the report of the director of Pest Infestation Research for the year 1950. London, H. M. Stationery Office, 1952. 38 p.

U. S. DEPARTMENT OF AGRICULTURE. Insects, the yearbook of agriculture, 1952. Washington, U. S. Govt. Print. Off., 1952. 780 p. + 72 plates.

MICRO-ORGANISMS

ANNUAL REVIEW OF MICROBIOLOGY. Charles E. Clifton, editor; Sidney Raffel and H. Albert Barker, associate editors. Stanford, Annual Reviews, Inc., 1952. v. 6. 492 p.

NEWSPRINT

U. S. CONGRESS. HOUSE. *Committee on the Judiciary. Subcommittee No. 5 (Antitrust Subcommittee).* Newsprint price rise. Part 3. Report of the Subcommittee . . . pursuant to H. Res. 95 (82d Cong., 1st Sess.) submitted by Mr. [Emanuel] Celler. Washington, U. S. Govt. Print. Off., 1952. 5 p.

PAPER—COATED

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Coating Committee.* Protein and synthetic adhesives for paper coating. TAPPI monograph series no. 9. New York, The Association, 1952. 187 p.

PAPER—PHYSICAL PROPERTIES

MICOUD, HENRI. Propriétés physiques des papiers; conférences faites à l'Ecole française de Papeterie. Preface de M. Achille Bergès. Grenoble, Imprimerie F. Eymond et ses Fils, 1933 [reprinted 1951] 2 v. 417 and 274 p.

PAPER—TESTING

SOUDER, WILMER, and NEWMAN, SANFORD B. Measurement of the thickness of capacitor paper. U. S. Natl. Bureau of Standards circular 532. Washington, U. S. Govt. Print. Off., 1952. 10 p.

PLASTIC MATERIALS

LEARMONTH, G. S. Laminated plastics. London, Leonard Hill Limited, 1951. 268 p.

MODERN PLASTICS encyclopedia and engineer's handbook, 1952. New York, Plastics Catalogue Corp., 1952. 848 p.

The 1952 edition is again published in bound form, although somewhat reduced in size. It is supplied free to subscribers of *Modern Plastics*. The book is arranged along similar lines as the preceding volumes; with the exception of the loosely inserted "Plastics properties chart," the charts are included in the binding (*cf.* B.I.P.C. 22: 234).

TANNINS

NORTHEASTERN WOOD UTILIZATION COUNCIL. Tannin from waste bark. Bulletin no. 39. New Haven, The Council, 1952. 31 p.

TEXTILE INDUSTRY AND FABRICS—YEARBOOKS

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS. 1952 technical manual and year book. New York, Publ. for the Association by Howes Publ. Co., c1952. v. 28. 643p.

TRADE DIRECTORIES

SOURCE OF SUPPLY directory, 1952 ed. Chicago, Howard Publ. Co., 1952. v. 27. 884 p.

WASTE PAPER

VEREIN ZUR FÖRDERUNG DES ALTPAPIERAUFKOMMENS e.V. HESSEN. Altpapier; ein Beitrag zur Veredelung und Sortierung von Altpapier. [Darmstadt, Roetherdruck, 1951] 54 p.

WOOD-PULP

UNITED STATES PULP PRODUCERS ASSOCIATION. Wood pulp statistics, 1952 ed. New York, The Association, 1952. 227 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABSORPTION SPECTRA

LAURENT, TORVARD C., and WERTHEIM, EMIL M. Effect of ultraviolet light on absorption spectra of carbohydrates. Acta Chem. Scand. 6, no. 5: 678-81 (1952). [In English]

The absorption spectra of alkaline solutions of carbohydrates change under ultraviolet irradiation; the maximum is at 265 mμ. On acidification the maximum shifts to 245 mμ. The spectra of galacturonic acid and glucosamine are also shifted in acid solution. 3 figures and 9 references. L.E.W.

ADHESIVES

MACLEAN, H., and GARDNER, J. A. F. Bark extracts in adhesives. Pulp Paper Mag. Can. 53, no. 9: 111-14 (August, 1952).

Because of its content of phenolic materials, such as tannins and phlobaphenes, attention is drawn to the possibility of utilizing some of the extractive content of the bark from pulpwood and sawlogs in the manufacture of adhesives. Results are presented of initial tests on the usefulness of tannin extracts prepared by simple hot-water extraction of sea water-floated western hemlock bark. Western hemlock tannin reacts rapidly with formaldehyde and the product is compatible with phenol-formaldehyde resins. The tanin-formaldehyde product was substituted for up to 75% of the phenol-formaldehyde resin in a weatherproof plywood adhesive without impairing the strength and durability characteristics. 6 tables, 1 figure, and 8 references. E.S.

TABOR, D. Basic principles of adhesion. Repts. Progress Applied Chem. 36: 621-34 (1951).

A review of the literature on some of the fundamental aspects of adhesion (thermodynamic and other physicochemical, as well as mechanical and physical factors) is presented. 79 references. E.S.

ALKALINE PROCESSES

HOLZER, W. F., and BOOTH, K. G. Reactions in the kraft process. Pulp Paper Mag. Can. 53, no. 9: 91-4 (August, 1952).

A summary and critical review of the present knowledge of the reactions and the chemical balances in the kraft process are presented. Various gaps and discrepancies are pointed out, with particular reference to the need for pilot-plant scale experiments. Most of the presently available basic information was obtained under conditions too far removed from practice; the gap between the test tube and the five-ton digester is too large and it is difficult to translate such information to commercial practice. 1 table and 14 references. E.S.

NOLAN, WILLIAM J., and BROWN, WILSON F. Experimental development of high-speed continuous alkaline pulping. Pulp Paper Mag. Can. 53, no. 9: 98-110 (August, 1952).

The alkaline pulping variables of concentration, temperature, and time have been studied, and their effects on the cooking of slash pine and turkey oak are presented. A solid-liquid interface theory of pulping, in contrast to the old penetration theory, is suggested as the mechanism of the pulping reaction. The use of a constant cooking temperature and of a sustained concentration were found to increase reaction rates to such a point that increased chip-surface area is required for efficient pulping. The methods of producing increased chip surface by mechanical treatment are discussed, and the effects of such treatment on fiber strength are presented. It has been found that such mechanical pretreatment of chips results in pulps of a higher screened yield and a shorter cooking time when cooked by conventional batch methods than when mill-size chips are used. The use of mechanical pretreatment, constant temperature, and sustained concentration are shown to produce high-quality pulps of good yield in 15 minutes or less pulping time. These conditions are ideally suited for continuous pulping, and the short cooking cycles involved should make such methods practical. A definite relationship between the concentration of alkali and the percentage of pentosan in pulps has been found to exist. It is possible to produce pulps of very low pentosan content by pulping at a constant concentration of 50-80 grams per liter without resorting to the use of acid prehydrolysis. Data are given which show the pulping conditions under which pulps of high purity may be produced from turkey oak. Preliminary strength data are presented for slash pine pulps cooked under constant conditions and with mechanical pretreatment of chips. 3 tables, 22 figures, and 1 reference. E.S.

NOLAN, W. J., HARVIN, R. L., REEDER, L. M., and ROTHROCK, C. W., JR. Studies in continuous alkaline pulping. I. Evaluation of variables for rapid pulping. Tappi 34, no. 12: 529-38 (December, 1951); *cf.* B.I.P.C. 22: 417.

Experimental pulping experiments were carried out on turkey oak and slash pine for the purpose of increasing the reaction rate to the point that continuous pulping will be commercially feasible. The reaction between oak chips and alkaline liquors was studied at constant steam pressure, using normal liquor ratios. It was found that elimination of the warm-up time usual to batch cooking was not sufficient in itself to accelerate the reaction to the desired degree. The reaction between oak chips and alkaline liquors was studied at constant steam pressure and sustained liquor concentration. Reaction rates were extremely rapid but yields in the range of 40 to 50% produced pulps very high in screenings. Low screening content required pulping to very low yields. The need for an expanded surface area of the wood was indicated, and the wood surface of the chips was expanded by mechanical treatment prior to pulping. It was found that pulps could be produced from either oak or pine in 15 minutes' reaction time. The yields were satisfactory and the screenings content of the pulps was very low. High α-cellulose content (90 to 93%) and low pentosans were characteristic of the pulps. Turkey oak chips were steamed in slightly alkaline solution at 170 p.s.i.g. for softening and passed through a hammer mill with half-inch expanded metal as a discharge screen. Chips thus pretreated were cooked 10, 15, and 20 minutes at 148 p.s.i.g. with alkaline solutions of 35 and 50 grams per liter (25% sulfidity). It was found that 50 grams per liter of liquor was too strong, whereas 35 grams per liter produced a pulp of 43.7% yield containing 0.5% screenings in 15 minutes. The pulp showed an analysis of 93.3% α-cellulose and 9.0% pentosans. The process indicated good possibilities for the production of dissolving pulps from oak. Pine chips were pretreated in the same manner and pulped under the same conditions as oak. At 50 grams per liter and 15 minutes' pulping time, pulps of 47.8% yield and 3.4% screenings were obtained. Tear and double-fold strength were

superior to pulps produced by standard batch processes. They were somewhat lower in burst factor and breaking length, probably on account of low pentosans content (3.6%). Further research is necessary to expand the range of pulping variables, as only 35 and 50 grams per liter active alkali, 25% sulfidity, and 148 p.s.i.g. steam pressures were studied. A great deal of additional work is also required on methods of achieving the most efficient surface expansion of chips. 4 tables, 4 figures, and 6 references. E.S.

ASPEN

JORANSON, PHILIP N. "Extra-heredity" aspen breeding initiated in Wisconsin. Paper Mill News 75, no. 38: 112, 114, 116 (Sept. 20, 1952); *cf.* B.I.P.C. 12: 143.

The breeding program is outlined which the Rhinelander Paper Co. and Marathon Corp. support at Beloit College for developing extra-heredity types of aspen (tetraploid or triploid types) in Wisconsin. 1 table. E.S.

ASSOCIATIONS

OVERALL, JAMES E. Review and preview; the Southern Pulp and Paper Society, August, 1952. Southern Pulp Paper Manuf. 15, no. 9: 50 (September, 1952); *cf.* B.I.P.C. 21: 762.

A brief review of the activities during the first year of the society is given and plans for 1953 are announced. The society expects to become soon a local section of TAPPI. E.S.

PROCTOR, CHARLES S. A Yankee paperman chronicles the highlights in long history of Boston Paper Trade Association. Paper & Paper Products 94, no. 1: 16-17 (Sept. 20, 1952).

The development of the Association from its inception in 1886 to the present is sketched briefly, and a list of past presidents and their companies is appended. L.C.

SCHLÄPFER, E. Report of the annual meeting of Zellcheming, Garmisch-Partenkirchen. Textil-Rundschau 7, no. 8: 376-82 (August, 1952). [In German] *cf.* B.I.P.C. 23: 5.

A report of the annual meeting of 1952 is presented, including abstracts of a number of papers. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Sixth Engineering Conference. Tappi 34, no. 11: 94A, 96A, 98A, 100A, 102A, 104A, 106A, 108A (November, 1951); 35, no. 9: 119-53A (September, 1952).

The first reference is a report of the Conference at Savannah, Ga., October 15-18, 1951. The second reference deals with the minutes of the meetings and includes the discussions of the papers, most of which have been published in different issues of *Tappi*. It is suggested that both references be used together. E.S.

BARKERS AND BARKING

HARVIN, R. L., NOLAN, W. J., and BROWN, WILSON F. The barking of turkey oak. Tappi 35, no. 9: 164-8A (September, 1952).

Very little information on the barking of oaks, particularly turkey oak (I), is available in the literature. The present study was undertaken to obtain data on a commercially satisfactory barking method of (I). Two types of barking were investigated—drum barking as usually practiced in the South, and a method which consists of chipping the log with adhering bark, screening, and separating the bark from the chips by air-flotation equipment. Drum barking was found to be satisfactory under the conditions of the experiment; however, the time required was at least two to three times that normally needed for southern pine. Screening of the material obtained by chipping (I) logs with adhering bark removed some of the bark but was not sufficient in itself. Air separation of the material obtained from the screening of the chipped (I) logs with adhering bark gave a product which contained approximately 5% bark. 5 tables, 2 figures, and 6 references. E.S.

MACDONALD, A. G. Chemical debarking of western species. Can. Pulp Paper Ind. 5, no. 9: 78, 80, 82 (September, 1952).

Preliminary data are presented on the program of chemical debarking studies of three major West Coast pulpwood species (western hemlock, Douglas-fir, and alder), which was initiated by the Western Branch of CPPA in the summer of 1951. Consideration is given to the major points under investigation, the chemicals tested (most experiments were with sodium arsenite and ammonium sulfamate), and the different aspects which require investigation, including safety in handling the chemicals and the effects on wildlife. D. J. Wort of the Department of Biology and Botany of the University of British Columbia is in complete charge of the three-year project. 6 illustrations. E.S.

BEATING

TOLVI, ERKKI K. Beating in a mill beater and jordan. [Continuation of Part III] Hydrafiner refining. Paper and Timber (Finland) 34, no. 8: 299-300 (August, 1952). [In Finnish; English summary] *cf.* B.I.P.C. 22: 810.

Beating studies with sulfate pulp were made in three different types of beating equipment, i.e., a hollander, a jordan, and a Hydrafiner. The results obtained under mill conditions are illustrated in three graphs as a function of power consumed per ton of pulp. With the hollander a mixed beating effect is obtained which results in a comparatively good tensile strength of the stock, whereas the other strength properties—tear in particular—are poor. With the same power consumption, the Hydrafiner produces the best values for all strength properties. The strength properties produced by the jordan lie between those obtained by the two other machines. 6 diagrams. E.S.

BIOGRAPHY

JAYME, GEORG. Emil Heuser to his 70th birthday. Das Papier 6, no. 17/18: 348-55 (September, 1952). [In German]

To commemorate the 70th birthday of Emil Heuser, a brief biography and review of his work and publications are presented. A list of the publications of Heuser and co-workers is appended under the subtitles: books and contributions to books, periodicals, articles, and patents (152 references). E.S.

BLACK LIQUOR—OXIDATION

ANON. Tower oxidizes odors away. Chem. Eng. 59, no. 9: 232, 234-5 (September, 1952); *cf.* B.I.P.C. 22: 94.

The processes involved in the operation of the black-liquor oxidation tower at Springfield, Ore. are outlined. The tower is designed to handle 300 gal. of black liquor from Douglas-fir pulping per minute; the odor problem of escaping hydrogen sulfide is greatly reduced, and sulfur may be recovered and returned to the cooking liquor to the extent that no further sulfur additions for maintaining the correct sulfidity are necessary. Sumps with properly balanced levels stabilize the foam at the liquid surface. 2 figures. E.S.

BOARD

RASCH, STEN. Auxiliary departments in the wallboard industry. Svensk Papperstidn. 55, no. 16: 533-9 (Aug. 31, 1952). [In Swedish]

The author discusses the cost of maintenance in the Swedish wallboard industry, including the required size of the crew, the organization of the maintenance department, and methods of payment. 2 tables and 6 figures. E.S.

BOARD—CONVERSION

BOXBOARD CONTAINERS. Folding paper box finishing operations. Article 10— Preparing finished cartons for storage and shipment. Boxboard Containers 70, no. 717: 46-8 (September, 1952); *cf.* B.I.P.C. 23: 7.

Different procedures used for manual packing or complete assembly-line treatment with automatic tying and sealing equipment, palletizing, and positioning on skids of folding boxes prior to delivery to either warehouse or customer are outlined. 5 illustrations. E.S.

BOARD—STATISTICS

BETTENDORF, HARRY J. Paperboard mill industry statistics. Fibre Containers 37, no. 8: 149-52, 154, 156-63 (August, 1952); *cf.* B.I.P.C. 22: 95.

Production and demand for paperboard ran very high in the first half of 1951 because of the Korean War scare, but dropped to a relatively low level in the second half. Tonnage production was 7% higher than in 1950, reaching a total of 11,840,600 tons. Present production is very good since, though lower, it remains above the average levels of all previous years. The value of board and converted products was nearly $4.4 billion in 1951. Containerboards represented over half of the production, folding boxboard production maintained or bettered its level, and setup boxboards continued a tendency to decline; special food boards began to show substantial development. Mills are operating at 75 to 85% of capacity, which is due partly to the 810,000 tons of new capacity added to the industry in 1951. Board prices have been lowered gradually because of inventory build-ups of raw materials and finished boxes, and lower raw materials costs. Further consumption depends on the discovery of new uses for paperboard and the establishment of higher standards of quality. Numerous statistical tables, diagrams, and graphs are included in the article. L.C.

BOARD MILLS

ANON. Certain-teed's Coronado mill. Paper Trade J. 135, no. 12: 140, 142-4, 146 (Sept. 19, 1952).

The operations and equipment of the new board mill of Certain-teed Products Corp. on Pryor Creek, Okla. are outlined. The mill makes daily about 100 tons of linerboard for gypsum wallboard, principally from waste paper, although some virgin pulps are used in the top liners of certain grades. 15 illustrations. E.S.

ANON. Continue improvements at Michigan Carton. Paper Trade J. 135, no. 12: 155-6, 158-60, 162 (Sept. 19, 1952).

Reference is made to the rebuilding of an older cylinder machine, and the operations in the mill in which the new board machine (The Angel; *cf.* B.I.P.C. 19: 382) is housed are outlined. 25 illustrations. E.S.

ASPLUND, GÖSTA. Some notes on the development of the wallboard industry and its geographical location. Svensk Papperstidn. 55, no. 15: 505-14 (Aug. 15, 1952). [In Swedish; English summary]

The present world capacity of the wallboard industry (western Europe and North America) amounts to about three million metric tons. The growth of the industry (total and regional) since 1922 is presented graphically and in maps. A resume of recently published data regarding new mills is presented. The number of mills arranged by size is shown in tabular form; a diagram illustrates the production, consumption, and foreign trade in wallboard of the principal countries. In another diagram, the flow of the raw materials in the wallboard industry from manufacturer via distributors to the final consumers is illustrated in schematic form. A discussion of the economic problems of the industry (potential demand, supply of raw materials, and cost factors) is included, and the need for cost reduction and further standardization is stressed. 2 maps and 4 diagrams. E.S.

PAPER TRADE JOURNAL. National Gypsum's new $5 million mill at Pryor. Paper Trade J. 135, no. 12: 134-6, 138-40 (Sept. 19, 1952); *cf.* B.I.P.C. 22: 730.

An illustrated description of the new board mill is presented. 17 illustrations. E.S.

CAUSTICIZING AND RE-CAUSTICIZING

MCCORRY, A. C. Caustic room operation. Yearbook Am. Pulp Paper Mill Supts. Assoc. 32: 141-2; discussion: 142, 144, 146 (1951); Pulp & Paper 25, no. 8: 48 (July, 1951).

The author describes the caustic room installations of the Tacoma mill of the St. Regis Paper Co., which permit the operation on a fresh-lime consumption of from 6 to 12 pounds per ton of pulp; this is considered a very low rate. E.S.

CELLULOSE

HEUSER, EMIL. The high points in the development of cellulose chemistry since 1876. J. Chem. Education 29, no. 9: 449-53 (September, 1952).

Following a brief outline of the status of cellulose chemistry in 1876, the year of the foundation of the American Chemical Society, the author discusses later important developments under the headings: hydro- and oxycellulose, Tollen's formula, molecular weight, molecular structure, and submicroscopic studies. E.S.

RÅNBY, B. G. The fine structure, crystallinity, and reactions of cellulose. Bull. assoc. tech. ind. papetière 6, no. 3: 67-78 (June, 1952). [In French] *cf.* B.I.P.C. 22: 754-5.

By means of the electron microscope, x-ray diffraction, and water sorption, the author studied the fine structure of wood cellulose (I), cotton (II), bacterial membranes (III), and animal cellulose (IV) (obtained from tunicates). The micellar widths of (I), (II), (III), and (IV) were, respectively, 75-80, 90, 100, and 120 A., and a fibril of 100 A. contained approximately 240-250 cellulose chains. The author studied in some detail the resistance of the various fibrils to alkaline mercerization and to acid hydrolysis; this resistance rose with increasing crystallinity in the following order: (IV) > (III) > (II) > (I). Although the methods of determining crystallinity or accessibility by physical means (x-ray diffraction, exchange with deuterium, and water sorption) appear at first to give very different results from those obtained by such chemical methods as hydrolysis and sodium periodate oxidation, the differences have been brought into closer harmony by the proper interpretation of the fine structure of cellulose—i.e., by taking into consideration that 20-25% of the chains in a filament 100 A. in diameter lie on its surface (and to a depth of 5 A.). 15 figures. L.E.W.

RÅNBY, B. G. Points of view regarding cellulosic wood fibers and their technological utilization. Bull assoc. tech. ind. papetière 6, no. 3: 78-89 (June, 1952). [In French]

The differences between α-, β-, and γ-cellulose (of which the latter is amorphous) are described. The role played by hemicelluloses is discussed fully, with special reference to hydration on beating. Cellulose is considered hydrophobic, whereas the hemicelluloses are hydrophylic. Future avenues of research are outlined. 14 figures and 16 references. L.E.W.

STAUDINGER, H. Macromolecular compounds. [362] Cellulose. [105] Colloidal solutions of celluloses and their derivatives. Bull. assoc. tech. ind. papetière 6, no. 3: 89-103 (June, 1952). [In French] *cf.* B.I.P.C. 22: 318.

A comprehensive review, principally of the author's work, is presented. 14 tables, 1 figure, and 33 references. L.E.W.

STAUDINGER, M. Macromolecular compounds. [363] Cellulose. [106] The macromolecular or micellar structure of solid celluloses. Bull. assoc. tech. ind. papetière 6, no. 3: 103-19 (June, 1952). [In French]

In a review article, unpublished data taken from the thesis of K. Indenbirken (Freiburg, 1949) are included. As an example, the retention (termed "inclusion") of a nonpolar solvent like cyclohexane (I) by cellulose (II) (*cf.* Staudinger and Döhle, B.I.P.C. 13: 466-7), even after drying at 0.1 mm. and 100° for 48 hours, was demonstrated with cotton (III) (ranging in D.P. from 589 to 2250) and with ramie (IV) ranging in D.P. from 600 to 1150). In most cases the analytical data (carbon and hydrogen) corresponded very closely to $(C_6H_{10}O_5)_6.C_6H_{12}$. To obtain such products, (II) was treated successively with water, alchohol, or acetone, and finally with (I). Similarly formed were inclusion products of mercerized (III), (IV), silk, and wool with carbon tetrachloride or pyridine. Inclusions of pyridine render the (II) more reactive towards acetylation; e.g., (IV) (D.P. =1800), when dried took up 0.9% acetyl in 24 hours and 3% acetyl in 17 days but, when activated with pyridine, the values were 13.6% and 36% acetyl,

respectively. Similar results were obtained for (III), flax (V), and hemp (VI). In these cases the acetylated (II) never reached the triacetate stage. Very similar results with more complete acetylation were obtained when the reaction was carried out with acetic anhydride and sulfuric acid pretreated with benzene. In this case (III) (D.P. = 2200)—which when dried was only very slightly acetylated (0.9% acetyl) by acetic anhydride and sulfuric acid at 60°—yielded a triacetate (44.9% acetyl) when pretreated with benzene. Very similar results were obtained with (IV), (V), and (VI) and when glacial acetic acid replaced benzene. When dried in vacuo, (III) or (IV) was acetylated with benzene-acetic anhydride-sulfuric acid, and acetylation was incomplete, even after 17 days, but some triacetate (soluble in chloroform) was always formed provided the raw material was low in D.P. (340 to 490). Similar results were also obtained for (V), (VI), and Lanusa fiber. The residues after such extraction contain relatively small amounts of acetyl (ordinarily 1.1 to 3.9%, but in one case 7%) and are largely unchanged (II). The author abandons the term micelle, as well as similar hypothetical aggregates. 8 tables, 22 figures, and 13 references. L.E.W.

CELLULOSE—DEGRADATION

DEAN, J. D., FLEMING, C. M., and O'CONNOR, R. T. Effects of unfiltered carbon arc light in accelerated weathering of cotton and other textiles. Textile Research J. 22, no. 9: 609-16 (September, 1952).

The degradative effects produced in cotton and other textile fibers by unfiltered light from a "Sunshine" type carbon arc lamp were compared with those which occurred in identical materials during exposure tests to natural weather, in which sunlight is believed to be the chief degrading factor. The samples consisted of bleached cotton print cloth, both finished (I) and unfinished (II), cotton yarns (III), and several yarns made from other cellulosic and noncellulosic fibers. In the case of (II) and (III), the results of both exposures were in fair agreement, whereas for (I), they were highly misleading. No satisfactory explanation could be advanced for this behavior, beyond the rather indefinite suggestion that various finishing agents may possess the power of absorbing light at certain frequencies and then re-emitting it at other frequencies. 4 tables, 4 figures, and 9 references. E.S.

CELLULOSE—HEMICELLULOSE

ADAMS, G. A. The constitution of a polyuronide hemicellulose from wheat straw. Can. J. Chem. 30, no. 9: 698-710 (September, 1952).

The structure of a polyuronide hemicellulose from wheat straw which contained xylose, arabinose, and hexuronic acid units has been investigated. Graded hydrolysis preferentially removed anhydro-L-arabinose units, leaving a xylan to which uronic acid units were attached. Methylation and hydrolysis yielded 2,3,4-trimethylxylose (2.7%), indicating one nonreducing end group per 37 units; 2,3,5-trimethyl-L-arabinose, 2,3-dimethyl-D-xylose, and 2-methyl-D-xylose were found in a molar ratio of 1:5:1. In addition, a methylated uronic acid complex was recovered which, on extensive hydrolysis, yielded an aldobiuronic acid. The latter, on reduction with sodium borohydride, yielded 2,3,4-trimethylglucose (1 mole) and 2-methylxylose (1 mole); the structure 2-methyl-3-[2,3,4-trimethyl-α-D-glucuronosido]-D-xylose was therefore indicated for the methylated aldobiuronic acid. A structure for the hemicellulose is proposed which consists of approximately 32 anhydro-D-xylose units linked β-1,4 in a chain to which five anhydro-L-arabinose and three D-glucuronic acid

units are attached as side groups by 1,3-glycosidic bonds. Results of periodate oxidation and estimation of reducing power support the proposed structure. 5 tables, 1 figure, and 17 references. E.S.

McDONALD, I. R. C. The chemistry of the wood cell wall. Part III. The isolation of beech hemicellulose A. J. Chem. Soc.: 3183-6 (August, 1952); *cf.* B.I.P.C. 23: 103.

Beech sawdust exhaustively extracted with alcohol-benzene and washed with warm water was extracted successively with 0.1 *N* sodium hydroxide, water, and *N* sodium hydroxide. The *N* sodium hydroxide extract was filtered and acidified with acetic acid, and the precipitate filtered, redissolved in aqueous sodium hydroxide, and precipitated with an equal volume of alcohol. The above procedure was repeated thrice giving 8.2% of "hemicellulose A" containing 81.4% xylan, 10.4% uronic anhydride, and 4.5% methoxyl, as well as small amounts of lignin and ash. Analyses of the alkali-extracted wood are also given and, evidently, appreciable amounts of the pentosans and uronic acids are retained in this residue. 4 tables. L.E.W.

CELLULOSE—HOLOCELLULOSE

HERBST, J. H. E. The preparation of chlorite holocellulose. Can. J. Chem. 30, no. 9: 668-78 (September, 1952).

Mildly acid sodium chlorite solutions were allowed to act on white birch and black spruce sawdust at room temperature for various times; the insoluble fraction and the soluble nondialyzable fraction were isolated and weighed. If chlorite acts selectively on lignin, the sum of these two fractions should, in time, approach true holocellulose. Chlorine and methoxyl determinations and examination of the ultraviolet absorption spectra showed that this was only approximately true. A small amount of carbohydrates was probably lost, and evidence was found for the existence of a chlorite-resistant lignin fragment in the soluble nondialyzable fraction. 3 tables, 4 figures, and 24 references. E.S.

CELLULOSE ESTERS

WARREN, JANE, REID, J. DAVID, and HAMALAINEN, CARL. Action of cyanuric chloride on cotton cellulose. Textile Research J. 22, no. 9: 584-90 (September, 1952).

The reaction of cyanuric chloride with alkali-treated cotton cellulose has been examined to determine the effect of reaction conditions on the degree of substitution and on the retention of chlorine for further modification. The type of alkali pretreatment and the choice of organic solvent were found to influence the reaction. The highest substitution obtained was one triazine ring per 1.9 anhydroglucose residues, based on nitrogen content. Although the highest chlorine content was one chlorine atom per 3.4 anhydroglucose residues, this residual chlorine was stable to heating at 101°C. and to several months of storage, and was capable of reacting with ethylenediamine and hexamethylenediamine. Strength loss during treatment was low and in no case exceeded 26% of the original. A change in dyeing properties was found to be related to the degree of triazine substitution in some cases and to the type of pretreatment in others. The treated yarn had some resistance to microbiological attack. 7 tables and 28 references. E.S.

CELLULOSE ETHERS

CHEMICAL WEEK. Fat profits in slimming. Chem. Week 71, no. 13: 83-4 (Sept. 27, 1952).

Reference is made to the booming market in cellulosic reducing aids—i.e., pills made with carboxymethylcellulose (CMC) or methylcellulose (MC). 1 illustration and 1 table. E.S.

REEVES, RICHARD E., BARRETT, BERNARD J., and MAZZENO, LAURENCE W., JR. The heterogeneous hydrolysis of highly methylated cotton cellulose. J. Am. Chem. Soc. 74, no. 18: 4491-4 (Sept. 20, 1952).

Upon heterogenous hydrolysis highly methylated cotton celluloses decrease sharply in viscosity (in chloroform solution), pass through minimum values and, upon prolonged hydrolysis, show increases in viscosity. Different minimum viscosities for different batches of methylcellulose are attributed to different crystallite dimensions produced during the methylation procedure; this explanation is supported by the x-ray diffraction patterns of the methylcelluloses. The initial viscosity decreases are ascribed to chain scission and the later increases to the more rapid destruction of the lowest viscosity material. 2 tables, 4 figures, and 10 footnotes. E.S.

CHEMICAL TESTING—BLACK LIQUOR

MANNBRO, NILS. A routine method for the control of black liquor oxidation. Svensk Papperstidn. 55, no. 15: 515-17 (Aug. 15, 1952). [In Swedish; English and German summaries]

When the iodine consumption of a black liquor is determined before (*a*) and after (*b*) boiling with ammonium chloride to expel the sulfide, the difference (*a* minus *b*) corresponds to the iodine consumed by the sulfide sulfur. The ratio *b*/*a* is called the oxidation ratio. Curves drawn for any mill relating the oxidation ratio to the degree of oxidation (i.e., the amount of sulfide oxidized as a percentage of the sulfide in the original black liquor) give an evaluation of the efficiency of the black liquor-oxidation installation. This relationship is based on the fact that, theoretically, all the sodium sulfide is oxidized to sodium thiosulfate. When the subscript 1 designates the nonoxidized liquor and the subscript 2 the oxidized liquor, the relationship may be expressed by the following formula: $b_1 + \frac{(a_1 - b_1) - (a_2 - b_2)}{4} = b_2$.

2 tables and 5 references. E.S.

CHEMICAL TESTING—CELLULOSE

BENNETT, EMMETT. Modification of Norman-Jenkins method for determination of cellulose. Anal. Chem. 24, no. 9: 1510-11 (September, 1952).

The material is treated for one hour on a steam bath with acidified sodium chlorite and for 10 minutes with a hot sodium sulfite solution. Further alternate treatments of acidified sodium hypochlorite and hot sodium sulfite are applied until the Mäule reaction is negative. 2 tables and 4 references. B.L.B.

CHIPS

NOLAN, W. J., and BROWN, W. F. Effect of chip size in alkaline pulping. Tappi 35, no. 9: 425-32 (September, 1952).

Slash pine chips, much smaller in cross section than standard mill-size chips, have been pulped. Land-yield data, chemical analysis, and the physical strength of the resultant pulps are compared with those obtained by pulping regular chips under identical conditions. Chip reduction was ob-

tained mechanically by use of a hammer mill with 0.5-inch expanded metal discharge screen. In one case, dry chips were fed to the hammer mill; in the second instance, chips were steamed 10 minutes at 170 p.s.i. in dilute sodium carbonate solution before being fed to the mill. Mechanically treated chips were separated into screen fractions of 4, 6, 8, 10, and 16 mesh. These screen fractions indicate cross-section dimensions at right angles to the grain since all fractions were about as long in grain direction as untreated chips. These small cross-section chips can be pulped to about 50% screened yield in 1.5 hours as compared with 43.4% in 2.5 hours from regular chips cooked under identical conditions. Pulps from chips hammer-milled without steaming are slightly lower in tear but otherwise as strong as pulps from regular chips. Pulps from chips which had been hammer-milled after presteaming were stronger in tear and fold and about equal in other factors when compared with pulps made from regular chips. The physical strength values of pulps made from small-size chips remain about constant from 4 through 8 mesh, 10 mesh shows a slight decrease and 16 mesh shows a definite drop in strength. Hammer-milling of dry chips prior to cooking offers good promise to present mill operation. The bulk density is 24% higher than that of regular chips, the yields of screened pulp are 50 instead of 43.4%, and the cooking time is reduced by one hour from the 2.5 hours for regular chips. Shorter cooking times with tolerance of some screenings in the pulp offer prospects of even higher yields if hot refining is used. The application of hammer-milling chips which have been presteamed should be confined to continuous pulping. Bulk density of treated wood is only 77% that of regular chips. Chip ends are broomed out and chips appear somewhat porous, making them well suited for high-reaction velocity with minimum degradation. 7 tables, 4 figures, and 6 references. E.S.

CHLORINE DIOXIDE

CASCIANI, FERRI. The preparation of chlorine dioxide. Paper Trade J. 135, no. 10: 22, 24, 26, 28, 30, 32 (Sept. 5, 1952).

A review of developments in the preparation of chlorine dioxide up to early 1952 is presented. 112 references. E.S.

CHROMATOGRAPHY

CASSIDY, HAROLD G. Investigation of paper chromatography; flow of fluid in filter paper. Anal. Chem. 24, no. 9: 1415-21 (September, 1952).

The factors which control the effectiveness of paper chromatography are of three kinds: those which affect the flow of liquid, those which influence R_f values, and those which influence the definition of zones. These three classes of factors are not mutually exclusive. The present article deals with the first class of factors which are analyzed in terms of bulk properties (I) and molecular properties (II) of paper and fluid. The major influential factors of (I) are porosity of the medium and viscosity of the fluid. Those of (II) are more numerous and are examined with reference to the chemical constitution of the supporting medium (cellulose, ash, and additives) and the flow of fluid in filter paper, including a discussion of the influence of density, surface tension, viscosity, moisture, and temperature. The analysis attempts to give an insight into the complexity of the problem and a brief survey of accomplishments to date. 1 table and 92 references. E.S.

DIMLER, R. J., SCHAEFER, W. C., WISE, C. S., and RIST, C. E. Quantitative paper chromatography of D-glucose and its oligosaccharides. Anal. Chem. 24, no. 9: 1411-14 (September, 1952).

A method for the quantitative determination of the distribution of oligosaccharides is described which was developed particularly for the analysis of mixtures of low molecular-weight polymers of D-glucose, such as those obtained in the enzymic hydrolysis of starch fractions; it is also directly applicable to D-fructose and to oligosaccharides containing D-fructose alone or with D-glucose. The procedure is based on the use of the anthrone reaction for the colorimetric measurement of the constituents resolved by paper chromatography and eluted from the paper. The analyses on known mixtures were usually within 5% of theory. There is no need for samples of the polymers for standardization and no need for knowledge of the types of linkage or molecular size of the compounds. The method is potentially of even wider applicability, because other hexose derivatives and polymers can be determined with the anthrone reagent. 4 tables, 2 figures, and 26 references. E.S.

COAL

GIVEN, DONALD M., JR., and MARSHALL, CARL A. Coal and ash handling. Tappi 35, no. 9: 40A, 42A, 44A, 46A, 48A, 50A, 54A, 56A (September, 1952).

The problem of coal and ash handling has frequently mitigated against the use of this fuel. The authors show that adequate handling equipment is available to provide cleanliness and labor-saving convenience in all sizes of boiler plants at a reasonable cost. Examples of typical installations are given, including mobile and stationary equipment, with particular reference to investment and maintenance cost. 3 tables and 16 figures. E.S.

CONTAINER INDUSTRY

BETTENDORF, HARRY J. Statistical summary of the paperboard group of industries. Fibre Containers 37, no. 8: 70, 72, 74, 76, 82, 84, 86, 88, 93-4, 96, 98, 100, 105-6, 108, 110, 112, 117 (August, 1952); *cf.* B.I.P.C. 22: 100-1.

The author presents the highlights of the general trends during 1951 and the beginning of 1952 and discusses the recent national recognition of the stature of paperboard. Significant comparisons of the industry's growth and the status of government control are made, and some of the basic trends in connection with raw materials, paper and board, and converted products are drawn together. Particular reference is made to the growth of the paperboard industry through the development of new uses. Numerous statistical tables and pie and block charts are included. E.S.

COOKING PROCESS

JAYME, GEORG, and WÖRNER, GÜNTHER. A new alkaline cooking process for plant substances. Das Papier 6, no. 17/18: 381-7 (September, 1952). [In German]

Following a brief resume of the results of their experiments with sprucewood and liquors having an increased reduction potential (*cf.* B.I.P.C. 22: 659-60, 903-4; 23: 14), the authors describe corresponding laboratory cooks with beechwood and alkaline liquors containing sodium hydrosulfite (sodium dithionate) (I). The cooking liquor contained 3.48 g. of sodium hydroxide and 6.25 g. of (I) per 100 ml. of liquid; maximum temperatures of 165 to 170°C. for four or eight hours were used. The liquor ratio amounted to 1:7.5 or 1:4.5, respectively. The lower ratio could be employed because a revolving digester was used. The following results were obtained: At the higher liquor ratio, yields of 57.4-59.8% with a lignin content of between

5.79 and 7.81% (holocellulose, 53.84-55.13%) were obtained; the corresponding figures for the lower liquor ratio were: yield, 64.75-67.6%, and lignin content, between 9.4 and 10.7% (holocellulose, 58.24-60.36%). The whiteness of the unbleached pulps amounted to 62.6% (measured in the Zeiss Leukometer and referred to baryta white). When the pulps obtained in 58.5% yields were bleached by a three-stage process involving chlorination, alkaline treatment, and hypochlorite bleach, a whiteness as high as 90% could be reached. The pulps could not be completely defibered in a Lightnin' mixer, but were readily defibered by the somewhat stronger mechanical treatment in a Jokro mill. With regard to the strength properties of the pulps, all values increased on beating to 72° S.-R. Maximum values of 7960 m. breaking length and a folding endurance of 6174 were obtained; the process compensates, therefore, for the morphological disadvantages of beechwood (thick cell walls and short fibers) to a large extent. These promising laboratory results warrant large-scale mill trials. 6 tables, 6 figures, and 17 references. E.S.

CORROSION

PEOPLES, R. S., and ERICSON, G. L. Corrosion of alkaline pulping digesters; analysis of corrosion questionnaires. Tappi 35, no. 9: 403-9 (September, 1952); Paper Mill News 75, no. 42: 100 (Oct. 18, 1952). [Abridgment]

This report contains the results of a study of corrosion problems in the paper industry as obtained from replies to a questionnaire sent to 63 pulp mills. The information revealed that corrosion has been significantly greater in digesters installed during the last 10 years. For example, of the digesters in operation during this period, 24% showed corrosion rates of over 100 mils per year, whereas essentially 100% of those in operation prior to this time showed rates of less than 50 mils per year. The data submitted, though thoroughly screened, were not adequate to establish whether the observed trend was the result of changes in operational and processing procedures, the type and quality of the steel, or unidentified variables. To determine the reasons for this trend, it would be necessary to obtain more precise and detailed information from either all the mills or selected mills in the industry with respect to processing procedures and data, more comprehensive and accurate corrosion information in regard to rates, type and location of attack, and a more complete chemical analysis of metal samples from digesters undergoing corrosion examination; to make a complete microscopic examination of representative metal samples, both from digesters giving long life and from those showing high rates of attack; and to secure more comprehensive data with respect to metal processing and fabrication on individual digesters. 10 tables. E.S.

COST—ACCOUNTING

ELLIOTT, NORMAN J. Pricing and estimating methods—control procedures. Article I. Cost accounting concepts. Boxboard Containers 70, no. 717: 40-1 (September, 1952).

This is the first in a series of articles covering the major aspects of cost and estimating methods and control procedures employed in the paper-box industry. 1 table and 3 illustrations of work reports. L.C.

COTTON

FITZGERALD, L. K. Cotton. Ind. Eng. Chem. 44, no. 9: 2164-6 (September, 1952).

The author discusses the opportunities and problems confronting cotton textiles as a result of the introduction of the newer synthetic fibers. Cotton continues to gain in consumption for apparel and household fabrics, and these gains are greater than the total production of synthetic fibers. The marked improvements of cotton through chemical research are mentioned. 5 references. E.S.

DIE-CUTTING

ANON. A die storage system with finger-tip control. Boxboard Containers 70, no. 717: 44-5 (September, 1952).

The Wilkata Folding Box Co., Kearny, N.J. employs a time-saving die-storage system whereby re-usable dies are tagged, wrapped, and placed in bins according to size. The tag stub, which gives the location of the numbered die, is filed in the office under the customer's name; any die requested can be located in a few minutes. 3 illustrations. L.C.

DIFFUSION

CHRISTENSEN, G. N. Diffusion in wood. II. The temperature coefficient of diffusion through wood. Australian J. Applied Sci. 2, no. 4: 430-9 +2 plates (1951).

The temperature coefficient of diffusion of sodium chloride through heartwood samples of three timber species has been determined over a range of temperature from 20 to 50°C., and in each of the three directions relative to the grain. For transverse diffusion in the two hardwoods tested, temperature coefficients were considerably greater than for diffusion in solution. An explanation in terms of the activation concept of diffusion is suggested. The development of this concept leads to the conclusion that high temperature coefficients may be indicative of the presence of narrow capillaries in the diffusion path. Both the rate of diffusion and the temperature coefficient of diffusion may be used in characterizing the capillary structure of wood. 10 figures, 4 tables, and 10 references. E.S.

CHRISTENSEN, G. N. Diffusion in wood. III. Ion selection and its effect on the diffusion of electrolytes. Australian J. Applied Sci. 2, no. 4: 440-53 (1951).

A study of the selective action of wood on ions diffusing through it has been made by measuring the rates of diffusion of electrolytes with (1) a series of univalent and bivalent cations and a common anion (Cl^-), and (2) a series of univalent and bivalent anions with a common cation (K^+). The rate of diffusion of hydrochloric acid at varying concentrations has also been determined, together with its effect on the permeability of the wood. The rate of diffusion through wood of solutes containing either a bivalent anion or cation was generally only a fraction of that for uni-univalent electrolytes. This effect is explained as the result of restriction on the diffusing anion by charged negative groups arising in the narrow capillaries from dissociation of carboxyl groups. This is consistent with the explanation advanced in Part II of this series (see preceding abstract) for the temperature coefficient of diffusion through wood and its relation to wood structure. That the anion was the restricted ion was confirmed from the measurement of concentration potentials across wood membranes. The conclusion is reached that in its behaviour towards diffusing electrolytes the wood acted as a negatively charged semipermeable selective medium. The extent to which this behaviour was manifested varied with the type of wood and the direc-

tion of diffusion relative to the grain. 7 tables, 1 figure, and 5 references. E.S.

CHRISTENSEN, G. N., and WILLIAMS, E. J. Diffusion in wood. I. A quantitative theory of diffusion in porous media and its application to wood. Australian J. Applied Sci. 2, no. 4: 411-29 (1951).

Previous investigations into the diffusion of water-soluble compounds through wood are reviewed briefly and the application of Fick's law to diffusion through a porous medium such as wood is discussed. It is shown that, for diffusion under nonsteady state conditions, it is not possible to characterize the diffusion system completely in terms of the single diffusion coefficient D determined at the steady state. A second parameter k, called the "pervious fraction," is necessary, together with a diffusion coefficient D' such that $D = kD'$. The pervious fraction is a function of the volume occupied by the solute and solvent within the porous medium. In studying the application of the above concepts to diffusion in wood, measurements of the rate of diffusion of sodium chloride through wood laminae and into wood blocks have been made. For diffusion through laminae, close agreement with Fick's law was observed. In the case of the wood blocks, change in moisture distribution during diffusion was a complicating factor. There is some evidence that not all the water present in the wood is capable of acting as a solvent for the diffusing solute. 2 tables, 6 figures, and 17 references. E.S.

EDUCATION

SCHNAUFER, M. F. Education of power plant personnel. Tappi 35, no. 9: 139-40A (September, 1952).

The need for training new power-plant personnel and bringing old personnel up to date is emphasized, and an outline of the prerequisites for the successful introduction of such a training program is given. The curriculum offered by the Dow Chemical Co. for firemen, engineers, dispatchers, and personnel in the instrument and control department is listed. E.S.

FERMENTATION PROCESS

PERLMAN, DAVID, BROWN, WILLIAM E., and LEE, SYLVAN B. Fermentation. Ind. Eng. Chem. 43, no. 9: 1996-2012 (September, 1952); *cf.* B.I.P.C. 22: 103.

A review of the literature on fermentation during the past year is presented, including references on spent sulfite liquor and alcohol and yeast prepared from it. 446 references. E.S.

FIBER—STRUCTURE

KLING, W., and MAHL, H. The morphology of the cotton fiber. I. The primary wall and its behavior on alkaline treatment. Melliand Textilber. 32, no. 2: 131-6 (February, 1951). [In German; English, French, and Spanish summaries]

An electron-microscopic investigation of the surface of cotton fibers following the kier boiling and bleaching operations showed extensive attack on the fibers. The outer wall of cotton fibers (which consists of a wax-pectin layer) is removed by extraction with organic solvents, alkaline treatment (including acid prehydrolysis), and chlorine bleaching, so that the underlying network of cellulose fibrils is exposed. A sharp demarcation between

the wax-pectin layer and the fibrils does not exist, so that the outer layer cannot correctly be called a "cuticle." The usual alkaline boil under pressure (kier boiling) removes this outer layer and represents a rather severe attack on the fiber. Wherever possible, it should be replaced by milder treatments. 17 figures (including 14 electron photomicrographs) and 11 references.
E.S.

KLING, W., and MAHL, H. The morphology of the cotton fiber. II. The bacterial decomposition of the cotton fiber and the structural elements of the secondary wall. Melliand Textilber. 33, no. 1: 32-7 (January, 1952). [In German; English, French, and Spanish summaries]

Cotton fibers were subjected to gradual bacterial decomposition and subsequently examined under the electron microscope. The structural elements of the primary wall were first laid bare, and the results were identical with those obtained with a stepwise alkaline treatment (*cf.* Part I). The secondary wall—i.e., the actual stem of the fiber—was found to consist of the following structural elements: individual fibrils, fiber bundles, and groups of fiber bundles. The individual fibrils have a thickness of from 100 to 200 A.; they run essentially parallel to one another and lie in the direction of the fibril bundle. The fibril bundles are composed of approximately 100 to 200 fibrils; they lie somewhat inclined to the fiber axis and participate in the known spiral twist of the cotton fiber. The groups of fibril bundles, with a cross dimension of about 0.5 μ, consist of 10 to 20 units; between these bundles, radially arranged gaps exist which correspond to the shallow grooves which may be noticed in the untreated fiber under the electron microscope. These grooves are preferentially attacked by bacteria as well as by chemicals; the deepening of the grooves may proceed to the total disruption of the fiber. The secondary wall is apparently covered by a homogeneous, resistant, intermediate layer, the exact composition of which is not yet known. It may be similar to the outer layer of the primary wall and consist of wax and pectin. 16 electron photomicrographs and 11 references.
E.S.

KLING, W., and MAHL, H. The morphology of the cotton fiber. III. Electron microscopic studies of fibrous cross sections. Melliand Textilber. 33, no. 4: 328-31 (April, 1952). [In German; English, French, and Spanish summaries]

A special cutting and reproduction technique was developed for making electron-microscopic pictures of the cross sections of cotton fibers. By treating the cross sections with caustic chemicals—which partially dissolve the fibrous substance—details of the fibrous structure could be made visible. The following results were obtained: The structural elements of the ripe cotton fiber consist, as seen in the cross section, of individual fibrils, bundles of fibrils, and band-shaped groups of fibril bundles (*cf.* Part II). The dimensions of these elements agree with those determined by other methods of investigation. In certain regions, the fibril bundles may also be arranged in layers. However, these layers run only in exceptional cases concentrically to the lumen; as a rule, they run obliquely to the lumen and the border of the cross section. In addition, they are considerably warped. 9 electron photomicrographs and 6 references.
E.S.

FIBER—TESTING

TALLANT, JOHN D. Use of a servo system for automatic opera-

tion of the Fibrograph. Textile Research J. 22, no. 9: 617-19 (September, 1952).

A simple method, which requires virtually no change in the Fibrograph (*cf.* B.I.P.C. 11: 81-2), is described for converting the instrument to automatic operation by the use of a servo system. The accessories required are rugged and are commercially available. Smoother fibrogram curves are obtained by this method, and less time is required, because the operator is free to comb the next test sample while a fibrogram curve is being drawn. 1 figure and 1 table. E.S.

FIBERS

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. TAPPI Fibrary. Addendum I. Tappi 35, no. 9: 178-80A (September, 1952); *cf.* B.I.P.C. 21: 466.

The first addition to the catalog of the TAPPI Fibrary at The Institute of Paper Chemistry is presented which brings the total number of specimens to 359. E.S.

FLAX

DEISSENBERG, CH., and DELAVEAU, M. Removal of incrusting materials from flax tow and degradation suffered by the cellulose. Bull. assoc. tech. ind. papetière 6, no. 3: 119-33 (June, 1952). [In French] *cf.* B.I.P.C. 22: 741.

The flax tow (I) contained 9.5% water, 3.7% extractives (alcohol-benzene), 10.3% pentosans, 13.7% lignin (Noll), 67.1% cellulose (Kürschner and Hoffer), and 1.8% ash. A series of 2.5-hour digestions were carried out with sodium hydroxide [varying from 9 to 18% based on the weight of (I) and using a liquor: (I) ratio of 4] at 160, 170, 180, and 190°C. A series of 5-hour and 10-hour digestions were also made at 160, 170, and 180° and a 5-hour cook at 190°. The authors determined pulp yields (II), alkali consumption (III), lignin retention (IV) in the pulps, and average D.P.'s (D.P. and the D.P. and percentage of α-cellulose in pulps bleached with chlorine and with sodium chlorite and acetic acid). (II), (IV), and D.P. decreased regularly with increasing alkalinity and increased digester temperatures. (III) increased with rising temperatures (within the concentration range of 12 to 18%). The action of sodium chlorite decreased the D.P. somewhat less than did chlorine, especially with pulps from raw cooks. By cooking five hours at 180° with various strengths of sodium hydroxide, the highest burst, folding endurance, and tear were found in a pulp obtained with 12% sodium hydroxide, beaten to 54° S.-R., and the highest breaking length (5479 m.) when this same pulp was beaten to 58° S.-R. The results of all data are expressed graphically and fully discussed. The slopes of the curves for (IV) and D.P. furnish a basis for prognosticating the best strength properties of pulps produced at a definite temperature and sodium hydroxide concentration. This is illustrated by various examples. 14 tables, 11 figures, and 6 references. L.E.W.

FOAM

SCOTT, G. V., and THOMPSON, W. E. Measurement of foam consistency. J. Am. Oil Chemists Soc. 29, no. 9: 386-91 (September, 1952).

Foams from detergent solutions may show large differences in apparent viscosity or consistency. Three different instruments (Mobilometer, Foam Consistometer, and Brookfield viscometer Model HAF) and several meth-

ods for the preparation and measurement of foams from solutions of various detergents are described. It was found that a decrease in foam consistency may be obtained upon addition of inorganic salts or of hardness and that a critical temperature range exists for such foams: the high consistency may be changed to a low consistency by raising the temperature. The data suggest a relationship between foam consistency and the liquid drainage and surface-viscosity characteristics of foam systems. High consistency values were obtained for foams having slow drainage rates and high surface viscosity. These characteristics for foams of detergent solutions are attributed to the presence of certain polar organic substances (e.g., saturated fatty alcohols and acids) which are strongly adsorbed at the liquid-air interfaces. 7 tables, 10 figures, and 12 references. E.S.

FOLDING BOXES

LILLIE, A. R., and BETTENDORF, HARRY J. Folding carton industry statistics. Fibre Containers 37, no. 8: 178, 180, 182, 184, 189-90, 192, 194, 196, 198, 200, 202, 204-7 (August, 1952); *cf.* B.I.P.C. 22: 104.

Folding paperboard production in 1951 amounted to 2,327,700 tons, a slight decrease from the 1950 all-time high volume; dollar sales at inflated levels misrepresent actual business conditions. The growth in the industry during the last 10 years has largely been in the special food type of carton (milk containers in particular), whereas there has been little growth in the volume of the traditional type of folding carton. This would indicate that the traditional folding-carton portion of the industry might profitably spend more thought and time on the promotion of its sales. The history of the paperboard milk bottle illustrates that folding boxes can change the merchandising methods of an industry in a way profitable to manufacturer, distributor, and ultimate user; the high profit factor that accompanies the smaller orders should not be forgotten by box manufacturers who are always looking for large-volume business. Statistical details of the industry (chiefly since 1941) are given in tables and graphs, including a map with folding-carton zones in the United States. E.S.

FOREST FIRES

HIGHSMITH, RICHARD M., JR., and BEH, JOHN L. Tillamook Burn: the regeneration of a forest. Sci. Monthly 75, no. 3: 139-48 (September, 1952).

An account of the disastrous fires in 1933, 1939, and 1945 is given, and salvage and rehabilitation operations to date are described. The total area burned comprised 355,397 acres and 12,662,932,000 board feet of timber are estimated to have been killed. 1 table, 12 figures, and 8 references. E.S.

FORESTS AND FORESTRY

CANADIAN PULP AND PAPER ASSOCIATION. *Woodlands Section.* 4-H club commentary; panel of club members. Pulp Paper Mag. Can. 53, no. 9: 137-8, 141-2 (August, 1952).

Six representatives of the 250 4-H clubs in Quebec discussed before the Association the meaning and activities of 4-H, especially its forest and wildlife conservation programs. L.C.

HOLT, LEIF. Thinnings. Pulp Paper Mag. Can. 53, no. 9: 129, 133 (August, 1952).

The author discusses the conditions under which thinning is necessary or advantageous to the forest management program of a pulp and paper company. The situation in each locale is different and, therefore, a general recommendation or repudiation of thinning cannot be made. 2 tables. L.C.

GLUE AND GELATINE

FYSH, D. Adhesives: animal glue. Repts. Progress Applied Chem. 36: 635-9 (1951).

A review of the literature dealing with the manufacture, physics and chemistry, formulations, and applications of animal glue during recent years (1946-50) is presented. 35 references. E.S.

GLYCERIN

LESSER, MILTON. Glycerine; a report on its use in printing inks, specialties and resins. Am. Ink Maker 30, no. 8: 34-7, 67 (August, 1952).

A review of recent developments is presented. 28 references. E.S.

GRASSES

BHAT, R. V., and VIRMANI, K. C. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part VII. Writing and printing papers from *Phragmites karka,* Trin. Indian Forester 78, no. 3: 127-37 (1952).

Laboratory experiments on the production of chemical pulps by the soda and sulfate processes from *Phragmites karka,* a reedlike perennial grass with a creeping rhizome, are described. The results indicate that suitable pulps for the manufacture of printing and writing papers can be prepared; however, the pulps are short fibered, and an admixture of long-fibered materials, such as pulps from sabai grass or bamboo, is essential for satisfactory manufacture on a commercial paper machine. *Phragmites karka* and *Arundo donax* grow in similar locations and are often confused with each other. The two reed species can be cooked together to produce good and clean pulps. *Phragmites karka* is available in large quantities in the province of Assam. Since transportation to places outside this province on an economical basis is not possible, the construction of a paper mill in Assam should be considered, where bamboo is also available in sufficient quantities. 5 tables, 2 references, and 2 sample sheets (one made from *Phragmites karka* alone, and the other from equal quantities of this reed and *Arundo donax*). E.S.

GROUNDWOOD MILLS

CAMPBELL, M. A. MacLaren's expansion program keeps pace with the times. Pulp Paper Mag. Can. 53, no. 9: 72-9 (August, 1952).

The new grinder room and wood-handling system of the James MacLaren Co. Ltd. at Masson, Que., are described; four Waterous fully automatic magazine grinders have already been installed, and eight additional units are on order. These will be set up in lots of two until the full complement of 12 grinders is in place. 2 flowsheets of the wood-handling system and grinder room and 15 illustrations. E.S.

NOAD, A. J. New electrical installation is important phase of MacLaren's Masson project. Pulp Paper Mag. Can. 53, no. 9: 80-3 (August, 1952).

The electrical system for the complete new installations in the grinder room and woodyard added at Masson are described. Six 5000-h.p. motors were required for the new Waterous grinders and some 3000 h.p. in smaller motors for the auxiliary equipment; a new second substation was built near the woodyard. 8 illustrations. E.S.

GROUNDWOOD PULP

EDWARDS, J., and CAMPBELL, W. BOYD. Outstanding problems in the manufacture of groundwood pulp. Pulp Paper Mag. Can. 53, no. 9: 88-90 (August, 1952).

The authors divide the principal outstanding problems in groundwood manufacture into two categories: those involving the improvement of the pulpstone and grinder design and those which deal with the actual happenings in the grinding zone and which probably consist of a series of interrelated mechanisms. Following a few general remarks on the advances in pulpstones, grinders, quality control, and the screening and thickening system, the authors discuss probable improvements in the groundwood process which may result from theoretical studies, such as the influence of stone grit, stone sharpening, and degree of softening of the pulpwood and an investigation of the difference in the coefficient of grinding and the required induction period following sharpening before a suitable quality is produced in a miniature grinder and a commercial unit (*cf.* B.I.P.C. 21: 576-7). It is to be hoped that work along these and similar lines will be undertaken and provide additional knowledge of the mechanism of the grinding process. E.S.

HARD WOODS

BHAT, R. V., GUHA, S. R. D., and PANDA, S. P. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part VIII. Writing and printing papers from *Boswellia serrata* Roxb. (salai). Indian Forester 78, no. 4: 169-75 (1952); Indian Pulp and Paper 7, no. 3: 179-83 (September, 1952).

Laboratory experiments with salaiwood (*Boswellia serrata*), a deciduous tree, showed that chemical pulps suitable for the production of writing and printing papers can be prepared by the sulfate process, using 20% of chemicals on the ovendry weight of the raw material, at a concentration of 50 g./liter, at 153-170°C. for a cooking period of from four to seven hours. Stem- or branchwood can be used either alone or as a mixture. The consumption of bleaching powder is less when branchwood is used alone, and the pulps have higher strength properties than those obtained from the stemwood. The extraction of the chips with water prior to cooking lowers the bleach consumption slightly. The chemical pulps are short fibered, so that long-fibered pulps from bamboo or sabai grass must be added to the furnish. Writing and printing papers with satisfactory strength properties have been prepared from a bleached salai furnish to which 25-40% of bleached bamboo pulp were added. The tree is quite common in certain parts of India; it is available in the vicinity of Sirpur Paper Mills Ltd., Hyderabad. The present investigation was undertaken at the request of the mill. 3 tables, 3 references, and 2 sample sheets (one made from 75% salai and 25% bamboo pulp, and the other from 60% salai and 40% bamboo pulp) in the first, and 3 tables in the second reference. E.S.

HEATING (INFRARED)

WESTBROOK, FRANCIS A. Increased paper production and better quality through infra-red heating. Paper Ind. 34, no. 6: 741-3 (September, 1952); *cf.* B.I.P.C. 22: 332-3, 579.

Possible applications of the radiant or infrared heating technique in the paper industry include drying at the wet end and the end of the drier section of a paper machine, and the finishing of paper with special surfaces or impregnations. Examples are given. Fuel selection (gas, oil, or electricity) on a cost basis and the need for adequate automatic controls are discussed. 4 illustrations. E.S.

HISTORY

ELLIOT, HARRISON. A century ago an eminent author looked upon paper and papermaking. Paper Maker [U. S.] 21, no. 2: 55-8 (September, 1952).

The author relates parts of Herman Melville's "The Tartarus of the maids," a short story which serves as a source of information on working conditions and machinery in the nineteenth-century paper mill. The kinds of paper Melville used for letters and manuscripts and the mills that manufactured them are described. 1 illustration. L.C.

SULLIVAN, FRANK. The President takes his pen in hand. Paper Maker [U. S.] 21, no. 2: 15-33 (September, 1952).

Letters written by Washington, John Adams, Jefferson, Madison, Monroe, John Quincy Adams, and Jackson are reproduced photographically. Both the subject matter of the letters and the paper they are written on are discussed in their historical settings. The laid and wove paper of the time and Thomas Jefferson's own crude tracing paper are described; private and manufacturers' watermarks are sketched. 24 illustrations. L.C.

VOORN, HENK. Germany's contribution to the study of papermaking history. Paper Maker [U. S.] 21, no. 2: 50-2 (September, 1952).

The development of the Institute for the Research of Papermaking History (Forschungsstelle Papiergeschichte) at Mainz in Germany is traced, and its research program and facilities are described. 2 illustrations. L.C.

VOORN, HENK. In search of new raw materials. Paper Maker [U. S.] 21, no. 2: 1-14 (September, 1951); *cf.* B.I.P.C. 22: 17.

This is an essentially complete translation of the previous reference. L.C.

WHEELWRIGHT, WILLIAM BOND. Established 1795; a chronicle of Bird & Son, inc. Paper Maker [U. S.] 21, no. 2: 37-46 (September, 1952).

The development of Bird & Son, inc., is traced from 1795 to the present. The firm is the oldest American paper company in continuous operation; it has been in the same family since its founding four generations ago. The introduction of new machinery, the development of specialty papers, and the broadening of interests to include box plants, roofing and flooring plants, and a machine company are described. 5 illustrations. L.C.

H-ION CONCENTRATION

WOODING, W. M. pH measurement and control. Paper Trade J. 135, no. 13: 19-27 (Sept. 26, 1952).

A summary and review of the chemical and electrochemical methods of pH measurement are presented. 10 figures and 32 references. E.S.

INORGANIC PAPER

CARBORUNDUM COMPANY, *Niagara Falls*. Ceramic fiber resists 2,300°F. Chem. Eng. 59, no. 9: 198 (September, 1952); Mech. Eng. 74, no. 10: 824-5 (October, 1952); Ind. Laboratories 3, no. 10: 96-9 (October, 1952); Can. Chem. Processing 15, no. 10: 16 (October, 1952); *cf.* B.I.P.C. 23: 22.

The properties of Fiberfrax are described. 1 illustration. E.S.

CHEMICAL ENGINEERING. Ceramic melt blown into fibers. Chem. Eng. 59, no. 9: 222, 224, 226-7 (September, 1952); *cf.* abstract above.

Possible applications and the operations involved in the manufacture of Fiberfrax are outlined. 2 illustrations. E.S.

LIGNIN

CAMPBELL, W. G., and MCDONALD, I. R. C. The chemistry of the wood cell wall. Part II. The isolation of beech and spruce acid-soluble and modified lignins. J. Chem. Soc.: 3180-3 (August, 1952); *cf.* B.I.P.C. 23: 56-7.

European beech (*Fagus sylvatica*) (I) and Sitka spruce (*Picea sitchensis*) (II) were extracted with alcohol-benzene, washed with warm water, oven dried, and in either case treated with 72% sulfuric acid at 10° for 16 hours. Sulfuric acid lignins were then isolated by the usual technique. Filtrates and washings from these lignins were passed through a Zeo-Karb 215 column (pretreated successively with 5% hydrochloric acid, water, ethanol, and water). The initial eluate showed a marked change in ultraviolet absorption. The column was then washed with 5% hydrochloric acid, water and, finally, alcohol. The latter (after long standing in the column) on careful evaporation *in vacuo* of the eluate, gave 7.4% solids from (I) and 5.8% from (II). The residues were resinous powders much lower in percentages of carbon and methoxyl than the insoluble lignin obtained, respectively, from (I) and (II). They are termed acid-soluble lignins. Similar techniques were applied to lignin hydrolyzates from partially delignified (I) and (II) residues (using sodium chlorite). In such cases, however, the "acid-soluble lignins" retained chlorine. (I) acid-soluble lignin from the wood had the approximate composition $[C_{40}H_{43}O_{20}(OMe)_5]_n$, whereas (I) acid-soluble lignin after chloriting, termed modified lignin, had the composition $[C_{40}H_{43}O_{20}(OMe)_5 \cdot 2HCl]_n$. The respective ultraviolet absorption spectra of acid-soluble and modified lignins of (I) and (II) are very similar. 1 table and 3 figures. L.E.W.

MEYER, HANAN, and BONDI, A. Lignin in young plants. Biochem. J. 52, no. 1: 95-9 (September, 1952); *cf.* B.I.P.C. 19: 322-3.

Alkali lignins were prepared from barley, from faeces collected from sheep fed exclusively with barley, and from cottonseed hulls. The materials used for lignin extraction and the isolated lignins were subjected to hy-

drolysis with dilute acid, water at 210°C., and alkali at 210°C. From determinations of the initial methoxyl content of all the lignins (after methylation with diazomethane and with dimethyl sulfate), the following conclusions were drawn: All treatments with acid, including the conventional lignin determination methods and treatments involving high temperatures, lead to extensive condensation reactions within the lignin molecule through the aliphatic and aromatic hydroxyl groups. A treatment with dilute alkali leaves lignin comparatively unchanged; a treatment with stronger alkali and at temperatures over 100° leads to their gradual degradation. The nitrogen content of lignins is not due to their contamination with protein. The lignins contained in the plants investigated are very similar; probably all contain the same phenylpropane basic structural unit. The structural details of the lignin molecule are discussed in the light of the results obtained. 3 tables and 14 references. E.S.

TRAYNARD, PH., and ROBERT, A. Isolation of lignin from poplar by means of nitric acid. Bull. soc. chim. France no. 7-8: 746-50 (July-August, 1952). [In French] *cf.* B.I.P.C. 22: 913.

The authors present essentially the same information as in the previous reference. 11 references. E.S.

MACHINERY

PATTISON, D. M. Choosing new machinery and equipment; economic and philosophical considerations. Mech. Eng. 74, no. 9: 716-20, 741 (September, 1952).

The practical application of a proper replacement program for capital equipment and some of the basic principles of dynamic replacement are discussed. The author defines a good equipment policy and discusses the correct timing of new-capital equipment purchases and the cost of not replacing such equipment. Three typical examples are given to illustrate the application of the MAPI (Machinery and Allied Products Institute) replacement formula (*cf.* B.I.P.C. 21: 528). 1 chart, 3 illustrations of work sheets, and 5 references. L.C.

MACHINERY—BOOMS

COLLIER, R. D. The measurement of forces acting on the Outardes pulpwood booming system. Pulp Paper Mag. Can. 53, no. 9: 120-2, 125-6, 128 (August, 1952).

The use of electric strain gages in measuring the loads on the Outardes River booming system of the Quebec North Shore Paper Co. at Baie Comeau, Que., is described. The immediate objective of this work was to determine the actual working loads on some of the connecting cables and chains of the booming system and to obtain an idea as to the relative load distribution on the system. The strain on the cables is picked up by an aluminum test bar which elongates or contracts with the cable under tension or compression. A fine wire bonded to the test bar reacts sympathetically with the bar, and subsequent changes in its electrical resistance through alterations in its cross-sectional area are recorded on a portable strain indicator. Readings are then translated into actual load pounds on the basis of previous calibrations with a known load. The installation of the strain gage system is described in detail. The problems of holding pulpwood also call for enough measurements on the main causal factors (flow, local currents, wind, quantity of pulpwood, depth and area of the jam, and the degree of "arching") to obtain an idea of the relative magnitude of their effects on the boom loads. The results of the experiment are summarized,

and the practical significance of the data is noted. Plans to improve the system in the future are discussed. 14 figures. L.C.

MACHINERY—FILTERS

GREEN BAY FOUNDRY & MACHINE COMPANY. Maintenance of "North" water filters. Paper Mill News 75, no. 37: 26 (Sept. 13, 1952).

A brief description of the filter and its maintenance is given; it is primarily used in the screening of raw inlet water of any characteristics. 1 table and 1 illustration. E.S.

MACHINERY—PAPER MACHINE

BUECHLER, JACK. A modern trend in Fourdrinier design. Paper Mill News 75, no. 38: 60, 62, 64, 66, 72, 74 (Sept. 20, 1952).

The author presents several new ideas in the wet-end design of a Fourdrinier machine, some of which date back to 1933, and a number of which have never been proven by field tests. The future will show if some of the new principles incorporated in the "Hydroflyte Fourdrinier" will ever become a reality. Details of breast-roll and table-roll constructions, the adjustment and support of table rolls, Z-type water deflectors, saveall constructions, table rails, suction-box construction, suction couch roll, and a diaphragm chamber for cantilevering the wire and methods of lowering the breast roll and raising the wire and suction couch for wire changes are explained by means of diagrams. The basic principles of the machine have not been changed; the desire has been to improve the equipment to produce more paper at a higher speed and with less expense, with particular emphasis on the rapid changing of the wire. 16 figures. E.S.

CASSELL, ROBERT D. Pensacola No. 4's hydraulic system. Pulp & Paper 26, no. 10: 59-60, 62 (September, 1952).

The hydraulic control system of the new Bagley and Sewall Fourdrinier machine of St. Regis' Pensacola, Fla., mill is described in detail. The complete system actually consists of six basic systems: Fourdrinier auxiliaries, presses, automatic guides, felt stretchers, calenders, and a winder rider-roll drive system. The first four are served by a self-contained hydraulic power unit and console, located at the wet end. A similar unit supplies power to the hydraulic systems of the double, open-sided calender stacks, whereas another serves the winder rider-roll drive system. 4 illustrations. E.S.

MACHINERY—PRESSES

BAKER, R. R. Final report—press section load requirements. Tappi 35, no. 9: 390-4 (September, 1952); *cf.* B.I.P.C. 20: 569-70.

The results are presented of an additional study of the power requirements for normal running load and recommended drive capacity of the press sections, including main presses, smoothing presses, breaker stacks, and dual press sections, but not including presses operated on common felts. A number of the readings represented check readings of the original power data; these checked the original readings quite closely and appear, therefore, to substantiate the accuracy of the original data. 6 tables and 1 diagram. E.S.

MACHINERY—ROLLS

DAVIS, E. B. Use and care of printing rollers. Boxboard Containers 70, no. 717: 42-3 (September, 1952).

The author lists 15 types of natural and synthetic rubber rollers which have been developed for the printing industry. He suggests methods for the proper care of rubber products and describes the physical provisions for their maintenance. 2 illustrations. L.C.

MACHINERY—SLICE

DOMINION ENGINEER. Dominion slices and stock inlets. Dominion Engr. 19, no. 5: 10 p. (1952).

A short summary is presented of the many slices and stock inlets of typical present-day design which the Dominion Engineering Co. Ltd. is building, including the Van de Carr slice, the Dominion semipressure formation slice, the full-pressure stock inlet, and a special combination headbox and slice built for Bowater's Newfoundland Pulp and Paper Mills Ltd. at Corner Brook. 20 illustrations and 10 diagrams. E.S.

GOUGH, J. B. Flow in "converging nozzle" type slices—can negative pressure be present? Tappi 35, no. 9: 385-90 (September, 1952).

The author has investigated the pressure of the flow against a straight converging top slice plate, in an approximate manner, for any orifice or jet velocity (particularly at 300 and 600 f.p.m.), any orifice or slice opening (particularly at 0.36, 0.375, and 0.72 in.), and any convergent angle (particularly at 50, 40, 30, 20, and 10°) of the inclined top slice plate in relation to the horizontal bottom apron plate. The results indicate that a negative pressure (i.e., below atmospheric pressure) will be present at this inclined top-slice surface for a jet or approximate wire speed of 300 f.p.m., if in contact with the liquid or pond for any greater distance than approximately 6 in. from the lip edge, when the angle of convergence is 50° or more, or for any greater distance than approximately 9 in., when this angle is 30° or more. Thus a negative pressure will occur in a completely sealed nozzle (one having no pond or liquid-air surface), or in a sealed pond under a vacuum, if these critical lengths are exceeded. For speeds of 600 f.p.m. or more, no such negative pressure will be present, even at distances of 24 in. from the lip, unless the angle of convergence exceeds 50°, or unless a sealed pond is under a sufficient vacuum. However, with any liquid-air pond surface, it is possible that a negative pressure between the liquid and the surface of the inclined top slice plate will occur at and just below the point of intersection of the pond and the inclined plate surface, if the approach velocity of the pond surface is zero or very low. Two alternative methods of analysis are used, the first neglecting the effect of friction and the second taking it into account, approximately. The added effect of the curved flow, which may be present because of the usual hinge or curve in the top plate and which will lower these pressures still further, is also discussed briefly. The possibility of air entrainment at any liquid-air surface, such as an open or closed pond—if this surface intersects the inclined surface of the top slice plate and the surface velocity of approach is zero or very low, or if the pond surface intersects a curve or hinge in the top slice plate—is mentioned. The possibly bad effect of these negative pressures and of air entrainment on the smoothness and uniformity of the jet from the slice orifice and on the resulting formation and sheet quality is also discussed. 5 figures and 2 references. E.S.

MACHINERY—VATS

ROTHWELL, HARVEY. Tension control for winding cylinder moulds. Pulp Paper Mag. Can. 53, no. 9: 117 (August, 1952).

A device for winding the wire on a cylinder mold is described which results in a uniformly wound cylinder with correct tension and shortens considerably the time required for this operation. 3 figures. E.S.

MACHINERY—VORTEX-TYPE DIRT SEPARATOR

BAUER BROS. COMPANY, *Springfield, Ohio.* Develop new Centri-Cleaners for pulp and paper field. Paper Trade J. 135, no. 12: 119-20 (Sept. 19, 1952); Pulp & Paper 26, no. 10: 84 (September, 1952); *cf.* B.I.P.C. 22: 753.

The different types of Centri-Cleaners (I) developed jointly by the Hammermill Paper Co., the Howard Smith Paper Mills, Ltd., and Bauer Bros. Co., are described. (I) are vortex-type devices (covered by U. S. patent 2,377,524 and Canadian patent 429,584) for the continuous, effective rejection of bark specks, dirt solids, abrasive particles, fiber aggregates, shives, alien solids, etc. Their space requirements are small; they can be used on bleached and unbleached pulps and be installed in many different mill locations. 2 illustrations in the first and 1 in the second reference. E.S.

MATERIALS HANDLING

ANON. Hammermill host to APA group. Pulp & Paper 26, no. 10: 72, 74, 78, 112 (September, 1952).

The equipment and methods used by the Hammermill Paper Co. in the millyard and woodroom of its Erie, Pa., mill are described. 13 illustrations. E.S.

WILCOX, DONALD B. The engineering approach to material handling. Southern Pulp Paper Manuf. 15, no. 9: 38, 40-2 (September, 1952).

The author suggests a general method for studying materials-handling problems which proceeds from analysis through criticism to a satisfactory solution by compromise. Wherever possible, the application of mechanical equipment in the largest practicable handling units, using the straightest possible line, is recommended. E.S.

MILL MANAGEMENT

WILLIAMS, J. F. The preventive maintenance system at Iroquois Falls. Pulp Paper Mag. Can. 53, no. 9: 95-7 (August, 1952).

The development and operation of a preventive maintenance system in effect at the newsprint mill of the Abitibi Power & Paper Co. at Iroquois Falls are described. Extensive data are kept on each machine, and periodic and routine inspections are essential. Gantt-type charts are prepared for major maintenance or construction jobs. Some of the problems connected with the implementation of the system are mentioned. L.C.

MULBERRY

BHAT, R. V., and GUHA, S. R. D. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part VI. Writing and printing papers from paper mulberry (*Broussonetia papyrifera*). Indian Forester 78, no. 2: 93-9 (1952); *cf.* B.I.P.C. 23: 20.

Cooking experiments with paper mulberry have shown that easy-bleaching pulps in good yields and with good strength properties can be obtained by the sulfate process, using 20-26% chemicals on the ovendry weight of the raw material at a concentration of 45 g./liter at 153-162°C. for six hours. The pulps are short fibered, so that the addition of about 25% of a long-fibered pulp, such as bamboo, is required for the smooth running of the paper on the machine. Paper mulberry is a fast growing species which reproduces itself naturally and can be easily raised in plantations from seed. The establishment of such plantations in the vicinity of Indian paper mills is recommended. 3 tables, 3 references, and 2 sample sheets of printing paper (one made entirely of mulberry pulp, and the other from 75% mulberry and 25% bamboo pulp). E.S.

NEWSPRINT

ANON. Waterproofing newsprint. Can. Chem. Processing 36, no. 10: 94, 96, 98 (September, 1952); *cf.* B.I.P.C. 22: 339.

Reference is made to the studies by the American Newspaper Publishers Association Research Laboratories for waterproofing newsprint with Dri-Film (dimethyldichlorosilane). 3 figures. E.S.

ANSTRIN, HANS. The provision of the United States with newsprint. Svensk Papperstidn. 55, no. 16: 544-5 (Aug. 31, 1952). [In Swedish]

Data on the consumption of newsprint in the United States, imports, per capita consumption, price developments, and a forecast for 1960 are given. The year 1950 is the latest year considered in the present article. 4 tables. E.S.

OCCUPATIONS—DISEASES AND HYGIENE

SCHWEISHEIMER, W. The hand of the worker in the paper industry. Pulp Paper Mag. Can. 53, no. 9: 176, 181-2 (August, 1952).

The causes, cures, and extent of handicap of certain hand irritations which tend to develop among paper-industry workers are described. Common annoyances are callouses, black-liquor dermatitis, wound infections, excessive perspiration, trembling, and allergies. L.C.

ODOR TROUBLE—PAPER

CROCKER, ERNEST C. The nature of odor. Tappi 35, no. 9: 169-74A; discussion: 174-5A (September, 1952).

The basic facts known to scientists regarding the physical and chemical properties of odors are outlined. Cellulose itself has no odor or taste; odoriferous paper is contaminated paper. It is important that food containers contribute nothing whatever to odor. Typical off-odors found in paper and their sources are discussed. Four methods by which various papers may be tested for retained odors are outlined. They include: steaming the paper with the breath or otherwise dampening it and sniffing immediately; placing strips in odorfree jars partly filled with water, closing the jars, and tasting the water after standing; sandwiching butter in the paper and tasting the outer layer of the butter; and placing the paper in a closed container which holds smaller containers of mineral oil and water so that the sample is out of contact with the oil and water, and then sniffing the oil and water. The development of flavor profiles is discussed briefly. In conclusion, reference

is made to the sources of odor trouble of casein-coated paper which continues to give off odor almost through its entire life. 1 table, 10 figures, and 6 references. E.S.

PACKAGING

MODERN PACKAGING. Domino sugar. Modern Packaging 26, no. 1: 116-21, 212-13 (September, 1952).

The efforts of the American Sugar Refining Co. to gain acceptance for packaged sugar among retailers and consumers are described, and the development of the package and packaging methods, including those used at present, is traced. 16 illustrations. L.C.

MODERN PACKAGING. Hardware. Modern Packaging 26, no. 1: 99-105, 202-3 (September, 1952).

Numerous examples are given of successful hardware packaging now in use. Cellophane packets, acetate cylinders and boxes, and carry-home packs are among the most popular types. 25 illustrations. L.C.

MODERN PACKAGANG. Hardware. Modern Packaging 26, no. 1: Modern Packaging 26, no. 1: 128-32, 206-7 (September, 1952).

The basic requirements of military packaging for long-term storage and combat handling are discussed by the question and answer method. Examples of some of the specifications and suggestions for meeting them are given. 9 illustrations. L.C.

MODERN PACKAGING. Orange juice in a bag. Modern Packaging 26, no. 1: 110-13, 214-15 (September, 1952).

Pasco Packing Co., packer of citrus frozen concentrate, has developed a 2.5-ounce bag for frozen orange juice. The single service package, designed for use at Walgreen soda fountains, is composed of printed, anchored-type cellophane laminated to 0.002-in. polyethylene film; the combination is produced, filled, and sealed automatically. The entire process, from packaging to serving the orange juice, is described. 8 illustrations. L.C.

PAPER—COATED (HOT-MELT)

BURGESS, L. M., and SWEC, L. F. Progress in resin coating. Modern Packaging 26, no. 1: 151-5, 212 (September, 1952).

The properties of six hot-melt plastic coating materials are given: polyethylene, S-50 polymer, FM6503 nylon, vinyl chloride-acetate copolymer (VGGA-59139), cellulose acetate (Tenite I-S-flow), and saran. The hot resin-coated papers are compared in respect to coverage, water and water-vapor resistance, low temperature flexibility, heat-sealing properties, and mineral-oil resistance. The major end uses of these papers are determined by the combination of factors which is peculiar to each. In general, the high film strength and low viscosity of polyethylene resins recommend them for coating with normal waxing equipment. New hot-knife coaters will take polyethylene ranging from low molecular weight and melt viscosity to those of 20,000 molecular weight and melt viscosity of 10,000 poises. A schematic diagram of a typical extruder used for melting high-polymer materials is shown, and two extruder methods, hot-resin coating and extrusion lamination, are discussed. At the present time only polyethylene- and saran-coated papers made in this manner are being sold commercially. These relatively new processes must compete with established methods, such as solvent-coating

and film laminations. The rigid specifications of the raw stock used for coating are listed, and control tests for maintaining these standards are described. 5 tables, 2 figures, and 3 references. L.C.

PAPER—CONVERSION

ANON. Birmingham Paper Company. Southern Pulp Paper Manuf. 15, no. 9: 62 (September, 1952).

The success story of a southern paper converter is told. 2 figures. E.S.

PAPER—MERCHANDISING

MAYNARD, H. H. Sharpening the tool of management. Am. Paper Merchant 49, no. 9: 20-1 (September, 1952).

The economic position of the wholesaler is assured, but the individual wholesaler may fail through inefficient management. The author supplies some questions for the middleman's self-examination and advises him to train promising young men, to get to know his customers directly, and to develop the ability to delegate authority. L.C.

PAPER—PACKING

MATHIESON, W., and HOPKINS, A. B. Squeezer for wrapping small rolls. Pulp Paper Mag. Can. 53, no. 9: 94 (August, 1952).

A brief description is given of a squeezer to pull together two or more narrow rolls of finished newsprint prior to wrapping; it consists of a long rack to be inserted through the cores of the paper rolls and an Acme stretcher (a steel-banding tool) which squeezes the rolls together. 2 illustrations. E.S.

PAPER—SHEET FORMATION

LINDBERG, NILS J. The problem of sheet formation and new possibilities for its investigation. Paper and Timber (Finland) 34, no. 6: 227-36; no. 7: 275-82; no. 8: 287-98 (June-August, 1952). [In Swedish; English summary]

The investigation deals with sheet formation and closely related problems. A review of the pertinent literature on fiber properties, bonding, flocculation, and orientation is presented in the first two sections, with particular emphasis on methods for analyzing the strength properties and anisotropy of the paper sheet. Since the sheet in the paper machine is always dried under a certain tension, a mechanical conditioning takes place which results in increased tensile strength and decreased stretch. In the Paper Technology Department of the Finnish Institute of Technology the author has designed a sheetmaking apparatus which duplicates the conditions under which the sheet is formed on the paper machine. This dynamical sheet mold (which is described in detail) has a movable headbox which spreads the pulp suspension over a stationary wire to which a shake with variable frequency and amplitude can be applied. The resulting sheets have the same properties as the machine-made sheets; however, the disproportionate influence of drying is eliminated, because the sheets are dried in the same way as handmade sheets. From the strength of these sheets it is possible to draw conclusions with regard to the method of sheet formation on the Fourdrinier wire. The third part of the article deals with the mechanism of the wire shake; an attempt is made to explain the possibilities and extent of decreasing the initial orientation (from slice and wire) by means of the shake. The opinions

of different authorities vary greatly in this respect. These investigations were supplemented by slow-motion film exposures (64 pictures/second); they showed that a fiber layer is gradually sucked onto the wire. The suspension above this layer represents a wave motion; at the same time, it is displaced in relation to the bottom layer. This results in a dispersion of the fiber flocks. The maintenance of this original fiber layer is essential for the efficient operation of the shake; if it is disturbed by an exaggerated shake motion, the sheet is completely destroyed. An increased intensity of the shake improves sheet formation, first rapidly and then more slowly, until a point is reached where the formation of the bottom layer is ruined. This point depends upon the rate of water removal—i.e., a high rate causes the bottom layer to become more firmly attached to the wire, so that the shake intensity can reach high values without detrimental effects. Hence, the wire shake is particularly valuable for high-speed machines and those with short wires. The shake in the entire water-removal zone is important for decreasing fiber orientation. An effective shake—i.e., one which is constant throughout the whole water-removal process—can reduce the ratio of the tensile strength in the machine to cross-machine direction from about 1.5 to 0.9-1.1; the lower the fiber concentration, the lower is the ratio. A shake without water removal can in some cases increase the strength ratio of machine to cross-machine direction to a certain extent. The application of these theories to various paper-machine conditions is discussed. 2 tables, 16 figures, and 47 references. E.S.

WILLIAMSON, HARRY. Paper and paperboard making. XXI. Fourdrinier machine fundamental principles. Paper Ind. 34, no. 5: 600-1 (August, 1952); *cf.* B.I.P.C. 22: 363-4.

The fundamental principles of making a continuous sheet of paper on a Fourdrinier machine wire have not changed since the first continuous sheet was made. The formation of any sheet of paper—regardless of the type of paper machine on which it is formed—is affected by the woven wire mesh, the even distribution of the mixed volume of fiber and water, and the drainage of the water through the mesh of the woven wire. The time rate of this formation in process is affected by fiber, mechanical, and water conditions. The removal of surplus water is effected by two means—i.e., the application of atmospheric pressure (vacuum) and mechanical pressure. If machines are required to run much faster than present-day speeds, radical changes in the design of the formation unit must be considered; assuming that water will always be the carrying medium of the fibers to be formed into a sheet of paper, it will be in the control, method, and proportion of the application of the above basic forces that further progress in the speed of production and greater uniformity of desired qualities will become possible. A table "Comparison of formation time relative to machine-wire length" is included. E.S.

PAPER AND PULP INDUSTRY

ANSTRIN HANS. Forest resources and raw materials required by the industry. Svensk Papperstidn. 55, no. 15: 518-20 (Aug. 15, 1952). [In Swedish]

The wood supply and demand situation in the different provinces of Sweden, present market tendencies, and expansion programs are discussed. E.S.

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. *Pulp and Paper Committee.* Trend of the pulp and paper market. Tappi 35, no. 9: 161-4A (September, 1952).

Statistical information on the achievements in 1951 is presented; the trend of the market during the first half of 1952 and future prospects are discussed. 14 tables. E.S.

RITCHIE, JAMES L., and BETTENDORF, HARRY J. Wood pulp and pulpwood statistics. Fibre Containers 37, no. 8: 136, 138, 140, 142, 144-7 (August, 1952); *cf.* B.I.P.C. 22: 118-19.

The wood pulp consumption of the United States in 1951 totaled 18,500,000 tons, almost three times that of 1935. This phenomenal rise in demand is ascribed to population increase and, to a much greater extent, to an increase in per capita consumption. It is pointed out that, although a pulp supply may be adequate to meet over-all national requirements, it may be quite inadequate as regards a particular grade of pulp; individual consumers must then be prepared to alter their wood-pulp requirements within reasonable limits. A sharp trend toward North American self-sufficiency in wood pulp production is evident and capacity promises to reach 22,333,300 tons in 1955. Adequate supplies of wood will be available if there is a continued effort toward improved silvicultural methods and complete utilization of the current supply of wood resources through a broadening of the range of suitable wood species and the control of fiber waste. The oversupply of pulp and paper at present is discussed briefly. The authors attribute this situation to the operation of an inventory cycle in pulp products and an expansion cycle in pulp and pulp products. The latter may have a strong impact on supply-demand relationships unless the industry learns to generate new demand to absorb the growing supply. Numerous tables, diagrams, and pie and block charts. L.C.

PAPER AND PULP INDUSTRY—LAWS AND LEGISLATION

PARKER, LEO T. Legal riddles: questions and answers. Paper Ind. 34, no. 6: 743-5 (September, 1952).

The author discusses a number of recent higher-court decisions of possible interest to pulp and paper mill officials and employees. E.S.

PAPER AND PULP MILLS

ANON. Anglo-Canadian improvements include three new digesters. Paper Trade J. 135, no. 12: 105-11 (Sept. 19, 1952).

New developments in the groundwood, sulfite, newsprint, and board mills of the Anglo-Canadian Paper Co. at Quebec during recent years are outlined. 9 illustrations. E.S.

ANON. Crown Zellerbach's Camas mill developments August 1951 to August 1952. Paper Trade J. 135, no. 12: 80, 82-3 (Sept. 19, 1952).

Recent developments in the pulp and paper mill are reviewed briefly. 4 illustrations. E.S.

ANON. Fitchburg improvements. Paper Trade J. 135, no. 12: 164-6 (Sept. 19, 1952).

Improvements in the operations of the deinking plant and paper mills of the Fitchburg Paper Co., Fitchburg, Mass. are outlined. 5 illustrations. E.S.

ANON. From rags to writing paper. Rohm & Haas Reptr. 10, no. 4: 6-11 (July-August, 1952).

The operations involved in the manufacture of high-grade rag and rag-content papers at the mill of the Gilbert Paper Co., at Menasha, Wis. are described; reference is made to the recent extensive modernization program which includes the installation of a Hydrapulper, special Bertrams beaters, and a new feed-water treatment plant employing the hot-lime, ion-exchange process with an Amberlite resin. 6 illustrations. E.S.

ANON. M & O improvements emphasize diversification. Paper Trade J. 135, no. 12: 70, 72-3 (Sept. 19, 1952); *cf.* B.I.P.C. 22: 344-5.

The important modernization steps taken at the mills at Fort Frances and Kenora, Ont. and International Falls, Minn. during recent months are outlined. 6 illustrations. E.S.

ANON. Modernization at Champion-International. Paper Trade J. 135, no. 12: 65-6, 68-9 (Sept. 19, 1952).

Improvements to the pulp, paper, and coating mills of the Champion-International Co., Lawrence, Mass. are reviewed. 8 illustrations. E.S.

ANON. The new Elk Falls mill. Paper Mill News 75, no. 37: 10-12, 14-15, 18, 20, 22-5 (Sept. 13, 1952); Paper Trade J. 135, no. 12: 94, 96-7, 100-2, 104-5 (Sept. 19, 1952); Pulp & Paper 26, no. 10: 36-8, 41, 43-4, 114, 116-17 (September, 1952).

Although not identical, all three references give a profusely illustrated description of the new Elk Falls newsprint mill at Duncan Bay, B.C. E.S.

ANON. New straw pulp mill at Arnhem. Paper Trade J. 135, no. 11: 15-16, 18 (Sept. 12, 1952); World's Paper Trade Rev. 138, no. 14: 1055-6, 1061 (Oct. 2, 1952).

A brief illustrated description of the new Celdecor-Pomilio straw-pulp mill at Arnhem, Holland is presented, where 12,000 tons of bleached straw pulp for papermaking are produced per year. 11 illustrations. E.S.

ANON. Oxford modernization. Paper Trade J. 135, no. 12: 69-70 (Sept. 19, 1952).

Improvements to the Rumford, Me. and West Carrollton, Ohio mills of the Oxford Paper Co., are reviewed briefly. E.S.

ANON. Rhinelander expansion and modernization. Paper Trade J. 135, no. 12: 112-14, 116, 119 (Sept. 19, 1952); *cf.* B.I.P.C. 23: 35.

The semichemical unit for glassine pulp, new power-plant equipment, the new No. 8 paper machine, and other phases of the recent expansion program are described. 2 flowsheets and 5 illustrations. E.S.

CANADIAN CHEMICAL PROCESSING. Newfoundland pulp and paper mill . . . one of Canada's largest. Can. Chem. Processing 36, no. 9: 32, 34, 36 (August, 1952).

A brief description of Bowater's Newfoundland Pulp and Paper Mills, a six-machine newsprint mill, and the latest expansion program are given; the latter will involve an extension to the present digester building; blowpit room; sulfite washing, screening, and stock storage system; and a new boiler. 3 illustrations. E.S.

CANADIAN PULP AND PAPER INDUSTRY. British Columbia's new newsprint mill. Can. Pulp Paper Ind. 5, no. 9: 8-76 [interspersed with advertising] (September, 1952); *cf.* B.I.P.C. 22: 680.

A description of the new Elk Falls newsprint mill at Duncan Bay, B.C. (joint enterprise of Pacific Mills Ltd. and Canadian Western Lumber Co. Ltd.) consists of the following articles which are listed by authors and titles: Harris, Kingsley F. Unique is simplicity of design, p. 8-10; Anon. Elks Falls Company Limited; the company's record, p. 10; Anon. Men who guide Elk Falls, p. 11-14; Filberg, R. J. Management of forests resources, p. 16, 18, 21; Anon. The contractor, p. 22; Beaton, N. Selection of mill site, p. 24-5; Cook, A. An efficient wood handling system, p. 26, 28, 30; Anon. The grinder room, p. 32, 34; Cooley, E. C. Machine room and sulphite and product handling, p. 36, 38, 40, 42-3; McKeachie, J. G. Power for industrial development, p. 46, 48, 50; Puppyn, H. L. The power plant and waste utilization, p. 52, 54; Alexander, F. The electrical system, p. 56, 58; Elderfield, V. G. Instrumentation, p. 60, 62, 64; Tindale, W. J. Water supply system, p. 66, 68, 70; Bryant, J. L. Heating and ventilating system, p. 72-3; and McCusker, W. B. Stability comes to Campbell River, p. 74, 76. Numerous illustrations are included in all the articles. L.C.

PAPER INDUSTRY. St. Regis starts new machine at Pensacola. Paper Ind. 34, no. 6: 728-34 (September, 1952); *cf.* B.I.P.C. 23: 35.

The expanded pulp- and papermaking facilities of the St. Regis Paper Co. at Pensacola, Fla. are described. 1 table (equipment and suppliers) and 12 illustrations. E.S.

PAPER TRADE JOURNAL. Expansion and integration at St. Regis Pensacola Mill. Paper Trade J. 135, no. 12: 74-8, 80 (Sept. 19, 1952); *cf.* B.I.P.C. 23: 35.

A similar description as in previous references is given. 16 illustrations. E.S.

PAPER TRADE JOURNAL. $10 million expansion at Hudson's Palatka mill. Paper Trade J. 135, no. 12: 122, 124-8 (Sept. 19, 1952); *cf.* B.I.P.C. 23: 35.

A similar description as in the previous reference is presented. 9 illustrations. E.S.

PULP & PAPER. St. Regis Florida expansion. Pulp & Paper 26, no. 10: 52-4, 56 (September, 1952); *cf.* B.I.P.C. 23: 35.

The new developments at Pensacola are described. 18 illustrations. E.S.

PAPER MACHINE OPERATION

HANSEN, A. E. Problems relative to high-speed news machines. Yearbook Am. Pulp Paper Mills Supts. Assoc. 32: 92, 95; discussion: 95 (1951).

The author reviews briefly some of the problems involved in the operation of newsprint machines at high speeds, including stock variation and consistency, slice control and delivery, sheet formation, wire life, sheet conditioning and drying at the couch, take-off and handling and, particularly, couch noise. No really efficient solution to this last difficulty has yet been found. E.S.

WOLLENBERG, R. P. How we keep our machines in tip-top shape. Yearbook. Am. Pulp Paper Mill Supts. Assoc. 32: 91-2; discussion: 92 (1951); Pulp & Paper 25, no. 9: 83, 86 (August, 1951).

The author describes the maintenance and periodic inspection program on the high-speed machines of the Longview Fibre Co., as well as the relegation of the responsibility for reporting equipment in bad order. A generous provision of spares contributes to a minimum of outages. Continuously operating equipment was found to take much less maintenance than intermittently running machines. E.S.

PAPER MANUFACTURE

EDGE, S. R. H. Pulp and paper. Repts. Progress Applied Chem. 36: 517-24 (1951); *cf.* B.I.P.C. 22: 511.

The author reviews the technical advances in the production of pulp and paper which occurred during 1951. 40 references. E.S.

PAPER SPECIALTIES

ANON. Creped parchment paper. J. Franklin Inst. 254, no. 2: 196 (August, 1952).

Reference is made to use of creped parchment paper as a substitute for textile linings in the rubber trade; its advantages are that the creping adds considerably to its strength and permits the easy separation from tacky surfaces. The paper is generally supplied in rolls about 200 yards long and 38-39 inches wide; the degree of stretch can be varied up to about 70% of the original flat length. E.S.

ANON. The paper milk container. Pulp & Paper 26, no. 10: 30-2 (September, 1952).

The development of the paper milk container is described; the product which was practically unknown in 1930 now consumes over 300,000 tons of bleached chemical pulp. The story exemplifies the extent to which efficient development of an end-use product can promote actual tonnage consumption; although it is not easy, new products and new markets can again be developed for the benefit of the expanded pulp and paper capacity. 8 illustrations. E.S.

ANON. Sell boxed lunch paper requisites. Paper & Twine J. 26, no. 6: 9, 26-9 (August, 1952).

Specific examples are given of restaurants which have increased profits by catering to the send-out lunch trade. The field opens new profits to paper salesmen because of the large variety of specialty paper products employed in this service. The generally used products are listed and some of the special trays, bags, etc., designed for well-known restaurants are described. 1 table and 1 illustration. L.C.

PAPER SALES. Carry-out food service is a growing market. Paper Sales 12, no. 9: 12-14 (September, 1952); *cf.* B.I.P.C. 23: 45.

Essentially the same information is presented as in the previous reference with some additional facts on single-service paper ware for fountains and lunch rooms. A list of paper products needed in carry-out service is given. 1 table and 2 illustrations. L.C.

RAUSING, HANS. Paper consumption and milk packages. Svensk Papperstidn. 55, no. 16: 540-3 (Aug. 31, 1952). [In Swedish] *cf.* B.I.P.C. 22: 266-7.

The author describes the Tetra Pak milk package, the machinery employed for setting up, filling, and closing the cartons, and the method of packing the filled cartons in hexagonal metal or board containers. 7 illustrations. E.S.

PAPER STORING

MAYCOCK, F. J. The handling and storage of paper. Brit. Printer 65, no. 386: 67-8 (September-October, 1952).

The operations involved in handling and storage of paper prior to printing by the paper department of the Leagrave Press Ltd. are described, including the separation of stocks into two warehouses, systematic coding and stacking, protection against light and dust, the maintenance of uniform temperature and moisture conditions, and the selection of suitable stock for the job ahead. 1 illustration. E.S.

PARTICLE SIZE

MASTERMAN, F. E. Particle size of clay, its determination and effects. Tappi 35, no. 9: 420-5 (September, 1952).

An extensive study on the particle size of clay was made, and the properties of the clay fractions in relationship to the coating of paper are discussed. The procedure employing a centrifuge is described in detail. After analyzing several clays, coating mixtures were made and tested for brightness, gloss, pick, wet rub, and several other coated-paper properties. The results showed that, as the particle size decreased, gloss, brightness, adhesive demand, and opacity increased. 5 tables and 10 references. E.S.

PATENTS

HEGEL, KARL TH. Testing procedures in patent matters. Das Papier 6, no. 17/18: 376-80 (Sept. 5, 1952). [In German]

The author discusses the fundamental difference in the granting of patents in the Romanic system (I) (France, Belgium, Italy, Spain, Portugal, and certain South American States) and the Germanic system (II) (Germany, Holland, Austria, Czechoslovakia, and the Scandinavian countries). Under (I), patents are granted without further investigation or testing and without "guarantee" of the government, which assumes more or less the role of a registering agency, whereas under (II), the patent application is first inspected by an official "pretester" and, after being accepted by him, is posted for a certain length of time so that interested parties may file their objections or claims; these are then studied by the patent office which finally decides whether or not an invention is patentable. Between these two extremes, several transition systems exist, such as those in the United States, Great Britain, and Switzerland. The advantages and disadvantages of each system are discussed, as well as the opinions of the different patent offices with regard to what constitutes patentable and unpatentable subject matter, the effective date of reference, definition of printed publications, novelty, etc. Examples of the interpretation of different patent laws are given. The

author cites as advantages of (II) that fewer lawsuits are involved after the patent has been granted and that much subject matter unworthy of patent protection is eliminated; the granting of patents requires a longer time and a much larger qualified patent-office staff is needed than under (I). The postwar German patent office, which restarted operations on October 1, 1949 after a lapse of almost 4.5 years, omitted the inspection procedures; they were reintroduced on January 1, 1952. E.S.

WEST, CLARENCE J. United States patents on papermaking, second quarter, 1952. Tappi 35, no. 9: 154-61A (September, 1952); *cf.* B.I.P.C. 22: 843.

An annotated list of patents for the second quarter of 1952 is presented. E.S.

PAYROLLS—ACCOUNTING

FITCH, L. A. An inexpensive system for preparing a small payroll. Boxboard Containers 70, no. 717: 49 (September, 1952).

A fast, accurate method of accounting designed by Remington Rand, Inc. for preparing small payrolls involves the use of a Multi-Matic board and especially prepared accounting forms. 2 illustrations. L.C.

PHYSICAL TESTING—PAPER—BONDING OF FIBERS

WINK, W. A., CLINTON, THOMAS J., THICKENS, RICHARD W., and VAN DEN AKKER, J. A. Instrumentation studies. LXXIV. Determination of the bonding strength of paper. IV. Progress report on the development of a new method and new instrument. Tappi 35, no. 9: 181-8A (September, 1952); *cf.* B.I.P.C. 23: 23.

The new IPC bonding strength tester (*cf.* B.I.P.C. 21: 258) is described, and data on instrumental and procedural variables are presented. The new instrument is a rotary device which is so designed that end-point data may be obtained in a single run. Upon removal from the instrument, the specimen strip is inspected for end points, and the corresponding viscosity-velocity product (VVP) values are read from a scale laid alongside the strip. Of the various viscous materials which have been investigated, polyisobutylene appears to be the most suitable for the film which generates the disruptive stress on the paper specimen. This material appears to be Newtonian (although viscosity measurements cannot be made at the high rates of shear existing during a run) and is very stable. Various procedural techniques and variables are discussed, including the method for mounting the specimen strip (or strips when only short lengths are available), inspection of end points, and the influence of contaminations of the paper (particularly fingerprints), specimen backing, load on the film-carrying wheel, and the thickness of the viscous film. At least three end points may be employed simultaneously: the onset of blistering, the onset of slight picking, and the onset of general rupture. Fingerprints inhibit the disruption of the paper surface, so that the operator must handle the paper with canvas gloves. There is only a weak dependence of the VVP on the loading of the film-carrying wheel and, within a fairly wide range, generally also on film thickness; in consequence, the error resulting from the variability of the film thickness is usually very small. The dependence of the VVP is not the same for all papers, and it is concluded from this observation that the VVP may not in all cases be regarded as an accurate measure of bonding strength. In the absence of better means for measuring the bonding strength of paper in a direction perpendicular to the sheet, the error cannot be

measured. A comparison of the reported pressroom performance with regard to blistering, picking, and splitting with the VVP of a series of commercial coated papers shows that the correlation is of about the order which one might expect in view of the lack of control of various important variables in commercial printing operations. 3 tables, 4 figures, and 4 references. E.S.

PHYSICAL TESTING—PAPER—MOISTURE

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Moisture in paper and paperboard. Tappi 35, no. 9: 176-7A (September, 1952).

The text of the proposed revision of TAPPI Official Standard T 412 m-42 is presented. 3 references. E.S.

PHYSICAL TESTING—PAPER BAGS

ALLEN, R. J. L., and PAINE, F. A. Transport trials of paper bags. Modern Packaging 26, no. 1: 156-9, 199 (September, 1952); *cf.* B.I.P.C. 21: 867-8.

This is a reprint of the previous (British) reference, with the exception of the appendix containing eight tables. 7 tables, 4 figures, and 3 references. E.S.

PITCH TROUBLES

STOCKER, F. W. Pitch difficulties encountered in the pulp mill and treatments used to overcome them. Pulp Paper Mag. Can. 53, no. 9: 115-16 (August, 1952).

Some methods of controlling pitch in the pulp mill are discussed. In view of the high cost of chemicals used as pitch controllers, some mills are investigating the selective screening of pulp and the rejection of fines. Of the several pitch dispersants used, the phosphate compounds are the most effective in the bleachery. Other dispersing agents have been fairly effective, but in most cases the rather heavy dosage rates which are necessary for good control make their cost prohibitive. Some success has been obtained by the use of a combination treatment of tetrasodium pyrophosphate or a blended phosphate mixture and an anionic surface active agent. E.S.

PLASTICS

PARKIN, T. N., *and others.* Plastics. Repts. Progress Applied Chem. 36: 570-620 (1951); *cf.* B.I.P.C. 22: 518.

Members of the Plastics Group of the Society of Chemical Industry present the following reviews of the developments during 1951: Parkin, T. N. Plastics from natural polymers—3 tables and 143 references, p. 570-83; Finn, S. R., and Musty, J. W. G. Polycondensation products—87 references, p. 583-98; Gray, V. R., and Haward, R. N. Polymerization products—351 references, p. 599-620. L.C.

PLASTICS—TESTING

WITT, R. K., CHAPMAN, J. J., and RASKIN, B. L. Effect of moisture and fungus on plastic insulating materials. Modern Plastics 30, no. 1: 119-20, 122, 202-3 (September, 1952).

The mechanical and electrical properties of 28 plastic insulating materials (laminates, thermosets, and rigid thermoplastics) were investigated to de-

termine whether moisture or fungus or both cause equipment failures in humid areas; what kind of fungus was most detrimental; and what type of plastic was most easily ruined. The 11 tests applied are listed and some of the techniques are described. It was found that, although damage resulting from fungus growth may ultimately prove to be severe, the material, especially if it is of an electrical grade, will have lost its effectiveness, because of the high moisture content in the atmosphere, long before deterioration from fungus attack has become apparent. Of the materials studied, the laminated plastics (both paper- and cloth-base), often those of good electrical grade, were found to have shown the most extensive deterioration in electrical and mechanical properties because of moisture. Mechanical tests showed a marked decrease in the flexural strength and an increase in the Izod impact strength, both flatwise and edgewise. The tensile and compressive properties of most of these materials were found to be related to their flexural strengths, since in flexture both tensile and compressive stresses are present. 1 table, 10 graphs, and 1 reference. L.C.

POLYMERIZATION

WINDING, CHARLES C., and WEIGANDT, HERBERT F. Polymerization. Ind. Eng. Chem. 44, no. 9: 2052-64 (September, 1952); *cf.* B.I.P.C. 22: 129.

The number of publications dealing with polymerization increased about 55% over those cited for 1950; the largest increase was in the field of coating resins. The 1951 review includes 585 references. E.S.

PRINTING AND PRINTER'S INK—ANILINE PROCESS

TUTTLE, D. E., and HOAGLAND, STEWART. Aniline printing grows up. Am. Printer 133, no. 9: 25-7, 82-3 (September, 1952); *cf.* B.I.P.C. 22: 197.

The marked improvement in aniline printing, the flexibility of the process for many varied jobs, and possibilities for future uses are described. In "New name for aniline," an insert in the article, the efforts of the Packaging Institute to change the almost universally disliked term "aniline" are related. The three names submitted by the committeee to those interested in voting on the change are: flexographic process, permatone process, and rotopake process. 7 illustrations. L.C.

PRINTING AND PRINTER'S INK—BRAILLE

ANON. Three revolutionary developments speed Braille printing. Brit. Printer 65, no. 386: 35-6 (September-October, 1952); *cf.* B.I.P.C. 23: 42.

The new system of Braille printing and its advantages are outlined. 2 illustrations. E.S.

PULP STONES

JOHANSSON, O. S., and PETTERSSON, T. Reproduction of the profile of pulpstone surfaces. Svensk Papperstidn. 55, no. 15: 497-504 (Aug. 15, 1952). [In Swedish; English and German summaries]

Two methods for the reproduction of the profile of pulpstone surfaces have been developed. According to the first method, impressions of the

stone surface are obtained by pressing a thin aluminum sheet against the stone. By scanning this impression with a profilograph especially designed for this purpose, the surface profile could be recorded on a diagram. The instrument consists of a pin point fastened to a flexible beam which carries strain gages and which registers the motion of the beam; the curves thus obtained show only the average profile without details. In the other method, the pin point was held directly against the stone surface and the profile was recorded while the stone was moved very slowly. The general shape of the curves was the same in both cases; however, the second method recorded minute details. A 75-fold magnification was employed. The curves were evaluated in different ways. Statistical analyses indicated that the length of the curve could be measured with good reproducibility, whereas other measurements seemed rather doubtful. The relationship between curve length and depth of sharpening is discussed. Experimental grinding studies with simultaneous control of the profile were carried out; the results will be published at a later date. 3 tables, 11 figures, and 14 references. E.S.

RADIOACTIVITY

INDUSTRIAL NUCLEONICS COMPANY, *Columbus, Ohio.* Checking weight at each step produces uniform coated abrasives. Chem. Processing 15, no. 9: 70-1 (September, 1952).

A system of five beta-ray gaging stations is used to check the processing of coated abrasives at the Niagara Falls plant of the Carborundum Co., including the backing before the adhesive is applied, the adhesive application, and the grit. Sealed capsules of S^{90} provide the beta rays to penetrate the coated products; they register ultimately on recorders and are interpreted as measurements of weight per unit area. The gages operate continuously and are not affected by temperature, dirt, or humidity. 2 figures. E.S.

RAW MATERIALS

LØSCHBRANDT, F. Tropical fibrous materials for the wood-conversion industry. Norsk Skogind. 6, no. 8: 226-41 (August, 1952). [In Norwegian; English summary]

An extensive review is presented, including the forest resources of the world and their possibilities, the reasons for shortages, the conditions in individual tropical countries of Latin America, Africa, Asia, Australia, and New Zealand, and a discussion of certain prominent fibers (Parana pine, eucalyptus, bamboo, bagasse, and mixed cooks). 3 tables, 12 figures, and 4 references. E.S.

RAYON—VISCOSE PROCESS

BARTUNEK, RICHARD. Potash cellulose and potassium cellulose xanthate. Das Papier 6, no. 17/18: 356-8 (September, 1952). [In German]

Whereas chemical cotton can be completely dissolved by emulsion xanthation with sodium hydroxide (I) of the proper concentration (12-18%), only 60% can be dissolved by using potassium hydroxide (II), even in the optimum concentration of 25%. The potassium cellulose xanthate can be dissolved completely only by 8.5% (I). Carbon disulfide reacts more rapidly with (II) than with (I). The speed of reaction falls off above 43% (II), which corresponds to the hydrate richest in water ($KOH.4H_2O$). The difficult xanthation of potash cellulose is apparently due, not to a lack of affinity for carbon disulfide, but to lower swelling of the cellulose—i.e., the

potassium ion is less hydrated. The study of various alkalies in the xanthation process will indicate which of the xanthation phenomena are specific to the base used and which are common to the xanthation process itself. 3 figures and 4 references. K.W.,Jr.

BRÖTZ, AUGUST. Tire-cord rayon. Das Papier 6, no. 17/18: 368-72 (September, 1952). [In German]

The development of rayon-tire cords, their advantages and disadvantages in comparison with cotton, the requirements of the alpha pulp suitable for this purpose (high α-cellulose, 94-96%; low rosin, 0.03-0.1%, and ash, 0.1-0.2%; swelling in 18% sodium hydroxide, 300-450; and D.P., 870-890), and appropriate spinning methods are reviewed. In conclusion, reference is made to the unavoidable competition by fully synthetic fibers (notably nylon and Terylene) in the future, although certain problems in their application have yet to be solved; their price will also be much higher. 2 tables. E.S.

GOLDBERG, JULIUS B. Viscose. Ind. Eng. Chem. 44, no. 9: 2169-70 (September, 1952).

The author predicts that the newer synthetic fibers (nylon, Orlon, Acrylan, Dacron, dynel, and Vicara) will not cause any reduction in the use of viscose rayon, but will rather stimulate its application through the possibility of combinations with the synthetics and resulting improved properties. E.S.

RESEARCH

AMERICAN PAPER AND PULP ASSOCIATION. *Committee on Coordination of Research.* Technical problems of the pulp and paper industry. Tappi 35, no. 9: 14A, 16A, 18A, 20A, 24A, 26A, 28A, 30A, 32A, 34A (September, 1952).

A brief description of the sequential processes of papermaking is given for the benefit of the lay reader, and the technical problems which the industry now faces are discussed under the following headings: fibrous raw materials (including forestry and wood storage); utilization of waste (wood, bark, and lignin); pulping processes; recovery processes (kraft recovery and acid and neutral sulfite pulping processes); pulp washing; bleaching; water conservation (watershed management, water utilization in mills, and pollution abatement); deinking reclaimed paper; retention of beater additives (fillers and loading materials, beater adhesives, and sizing agents); corrosion problems (sulfite pulping, alkaline pulping, bleaching, and sizing); drying of paper; properties of pulp and paper (properties of fibers, crystallinity of cellulose, stress-strain characteristics, fading, loss of strength and brightness upon heating, and radiant energy absorption); converting operations (the penetration of liquids, the investigation of rheological and other properties of coating mixtures, and coating studies). L.C.

ANON. National Council for Stream Improvement; research and development activities. Paper Mill News 75, no. 38: 110 (Sept. 20, 1952).

The research activities of the Council at the University of Michigan, Rutgers and Purdue Universities, Oregon State College, Louisiana State University, Kalamazoo College, and Virginia Polytechnic Institute are reviewed briefly. E.S.

ANON. Pulp and paper research at the University of Florida. Paper Mill News 75, no. 38: 118-20 (Sept. 20, 1952).

Some of the problems under investigation at the Pulp and Paper Laboratory of the University of Florida are mentioned, including the pulping of scrub oak, high-speed continuous alkaline pulping, air flotation of scrub oak bark, the effect of chip size in sulfate pulping, dissolving pulps from sulfate pulp without acid prehydrolysis, utilization of bagasse, and several phases of the kraft process, including the utilization of tall oil and odor troubles. E.S.

ANON. Recent results of pulp and paper research at the Forest Products Laboratory. Paper Mill News 75, no. 38: 82, 84, 130 (Sept. 20, 1952); *cf.* B.I.P.C. 22: 132.

Recent research at the Forest Products Laboratory was concerned with the improvement of pulp yield and quality, the development and improvement of paper, paperboard, and other fiber products, and the diversification of species and utilization of wood waste. Hardwood utilization and high-yield processes (semichemical and cold soda processes) have received particular consideration. E.S.

ANON. Research for the paper industry at Battelle Institute. Paper Mill News 75, no. 38: 98 (Sept. 20, 1952).

Battelle Institute is particularly useful for conducting research on those problems outside of the scope of the laboratories which specialize in paper chemistry, including studies in forestry, metal corrosion, by-product utilization (tall oil and lignin), and printing qualities. Some research is conducted in the direct field of papermaking. E.S.

ANON. Research projects in the pulp and paper industry. Paper Mill News 75, no. 38: 76, 78, 81, 117, 128 (Sept. 20, 1952).

A summary is presented from the report of the Committee on Coordination of Research of the American Paper and Pulp Association which shows that 36 research institutions are now engaged in research projects directly related to the manufacture of pulp and paper. Brief excerpts are given of the reports of the following individual institutions: University of Maine; The Herty Foundation Laboratory; Purdue University; Polytechnic Institute of Brooklyn; Michigan State College; University of Washington; Western Michigan College; Northeastern Wood Utilization Council; College of Forestry, State University of New York; North Carolina State College; and University of Florida, Engineering Experiment Station. Several longer reports are abstracted individually. E.S.

ARONOVSKY, S. I., and LATHROP, E. C. Pulp and paper research at the Northern Regional Research Laboratory. Paper Mill News 75, no. 38: 92, 94, 96, 126 (Sept. 20, 1952).

This report deals principally with the work of the Pulp and Paper Section of the Agricultural Residues Division, including investigations on straw collection and procurement, preservation of straw in storage, pulping straw for corrugating paper, the mechanochemical process, and production of fine and bleached pulp, insulating board, and boxboard for wirebound containers. E.S.

THE INSTITUTE OF PAPER CHEMISTRY. Research at Institute of

Paper Chemistry. Paper Mill News 75, no. 38: 100, 126 (Sept. 20, 1952); *cf.* B.I.P.C. 22: 132.

The present discussion is concerned with additions to the research program (academic, institutional, and co-operative) since the previous paper for the period 1950-51 was written. E.S.

KOEPP, WALTER H., and HOOKER, LELAND W. Pulping and pulpwood research projects in northern Michigan. Paper Mill News 75, no. 38: 122-4 (Sept. 20, 1952).

Some of the major accomplishments of the research program of the Forest Products Research Division of the Michigan College of Mining and Technology, Houghton, Mich. are outlined, including the manufacture of corrugated board from cull hardwoods, acetate rayon from aspen, hardboard, bark removal, second-growth hardboard thinning, and a study of woods accidents. E.S.

WIESEHUEGEL, E. G. Forest research in the Tennessee Valley. Paper Mill News 75, no. 38: 88, 90 (Sept. 20, 1952).

The purpose and status of some current investigative projects of special interest to the pulp and paper industry by the Tennessee Valley Authority are outlined, including new sources of tannin from oak slab and cordwood, pulpwood thinnings of pine plantations, wood hydrolysis, preservation treatments, and selection of superior seedlings in tree nurseries. 4 illustrations. E.S.

RESEARCH LABORATORIES

ANON. Research advanced by new pilot plant. Paper Mill News 75, no. 38: 106, 108, 135 (Sept. 20, 1952); *cf.* B.I.P.C. 22: 852-3.

The equipment of the pilot plant of the new Crown Zellerbach Corp. Development Laboratory at Camas, Wash. is described; it includes a highly versatile laboratory coater and a laboratory-scale paper machine. 8 figures. E.S.

ANON. Specialists at work on frozen foods packaging. Packaging Parade 20, no. 236: 72-3 (September, 1952).

The Western Waxed Paper Division of Crown Zellerbach Corporation has erected a packaging research laboratory to serve frozen food packers and distributors. The services offered and some of the testing methods are described. 4 illustrations. L.C.

ROOFING FELTS

ANON. Bird's felt mill at Shreveport more than doubles capacity. Paper Trade J. 135, no. 12: 148, 150-2, 154 (Sept. 19, 1952); *cf.* B.I.P.C. 21: 113.

The installations and operations at the felt mill at Shreveport, La. are outlined; the mill has just been expanded to double its capacity. 14 illustrations. E.S.

SAFETY

GRAY, ROBERT W. Techniques of accident investigation and effective use of the results. Southern Pulp Paper Manuf. 15, no. 9: 32, 34 (September, 1952).

Examples are given of a simple photographic procedure which the Union Bag & Paper Corp. uses to present the results of accident investigations to the supervisors whose responsibility it is to take corrective actions. The pictures are made by a member of the safety staff, and a professional photographer is used only in the preparation of the glass slides; the technique is simple and inexpensive. 6 pictures. E.S.

SALESMEN AND SALESMANSHIP

FAIR, E. W., and YOWELL, L. Q. Financing the expenses of automobiles for salesmen. Am. Paper Merchant 49, no. 9: 22-3, 70-1 (September, 1952).

Under the subtitle, "Comprehensive study in St. Louis shows cost of various methods," the first author gives and interprets cost statistics on various salesmen's auto-expense allowances as reported by 218 companies using 4769 cars. Most automobiles were listed as salesman-owned, although some were company-owned and some were company-leased. The second author, using the subtitle "A southern paper merchant finds leased system very satisfactory," tells of the Bancroft Paper Company's plan. Terms of the lease contracts are discussed and costs are described which compare favorably with the former automobile plans of the firm. 1 table. L.C.

NETZORG, ROBERT. There is nothing modern in selling. Paper Sales 12, no. 9: 16-17, 54 (September, 1952).

The author lists four basic rules for good salesmanship and interprets them. He advises salesmen to: (1) expose yourself to your customers; (2) know your merchandise; (3) show enthusiasm in doing your work; and (4) make your customers feel you are looking out for them. L.C.

SHIPPING CONTAINERS

ROBERTSON, BEULAH C., and ARONOW, WILLIAM A. Tomato box economies. Fibre Containers 37, no. 10: 76 (September, 1952); Boxboard Containers 70, no. 717: 56 (September, 1952); Packaging Parade 20, no. 237: 161 (October, 1952); Am. Boxmaker 41, no. 9: 20 (September, 1952).

Studies have shown that the master containers used to ship prepackaged tomatoes employ up to 40% more fiberboard than is necessary. The one-piece stitched box, the regular slotted box, and the two-piece, half-telescope box are the most economical designs. 5 figures. L.C.

SAFEPAC CORPORATION, *San Gabriel, Calif.* Now it's insulated containers for flowers. Boxboard Containers 70, no. 717: 45 (September, 1952); Fibre Containers 37, no. 9: 102 (September, 1952).

An effective flower shipping container, insulated with preformed inch-thick Fiberglas board cut to line the sides, ends, top, and bottom of the box, has been developed. Because a set of liners is expensive ($1.30 to 1.60), shippers charge florists deposit on them until they are returned for re-use. 1 illustration. L.C.

SHIPPING CONTAINERS—MULTIWALL BAGS

ANON. Multiwall paper bags for packaging asphalt. J. Franklin Inst. 254, no. 3: 266 (September, 1952); Chem. Eng. News 30, no.

36: 3770 (Sept. 8, 1952); Packaging Parade 20, no. 237: 146 (October, 1952).

The Engineer Research and Development Laboratories, Fort Belvoir, Va. are investigating the practicability of packaging certain types of asphalt in multiwall bags for shipment to Army construction engineers in all parts of the world. The asphalt is loaded into the bags holding 100 pounds each in liquid form, while the bags are held in wooden scaffolds to help them retain their shape. A clay coating on the inner bag liner prevents sticking of the hot asphalt to the paper and facilitates stripping of the bag from the contents. After filling the bags must be stored for approximately 24 hours during which time the asphalt cools and hardens. Exposure, handling, and storage tests at low and high temperatures have been conducted; although deficient in some respects, the bags show promise of meeting the stiff military requirements. E.S.

SHIPPING CONTAINERS—STATISTICS

BETTENDORF, HARRY J. Fibre box industry statistics. Fibre Containers 37, no. 8: 164, 166, 168, 170-7 (August, 1952); *cf.* B.I.P.C. 22: 136.

In 1951, fiber-box production fell 11% below the record production of 1950, but the dollar value of shipments rose to $1.3 billion, an increase of $0.3 billion. Twelve new converting plants and 12 new sheet plants began operations. V-Box production reached a peak in 1951, increasing the square footage of solid-fiber boxes. Where there was expansion, the greatest relative growth continued in the South and Pacific areas of the industry; the greatest footage growth was shown in connection with double-faced, corrugated board. Price levels started falling after the O.P.S. ceilings were established early in 1951 and by early 1952 were 7 to 15% lower in the various container classes. Loss and damage claims—which had been declining since 1948—increased 12% over 1950. Numerous statistical tables and graphs are included in the article. L.C.

BIGGER, R. P., HANWAY, PAUL S., and BETTENDORF, HARRY J. Fibre can and tube industry statistics. Fibre Containers 37, no. 8: 208-9 (August, 1952); *cf.* B.I.P.C. 22: 136.

Consistent with the general trend of business, the fiber-can industry showed a leveling off in volume from the peak reached in the early part of 1951. Gross over-all sales are estimated to total about $122,000 million in 1951, about $5 million less than in 1950. The volume of ammunition containers and other defense items increased by about 65% over 1950 and helped to make up for the slump in certain sections of the civilian economy. There have been so many new types of coating materials, adhesives, and films of various kinds developed that the individual can manufacturer has not yet had time to evaluate them from the standpoint of new and expanded uses. The present trends in business conditions should provide the incentive for considering new developments and improvements and prove of ultimate benefit to the industry. 2 tables and 1 chart. E.S.

MATHER, GLENN, and BETTENDORF, HARRY J. Fibre drum industry statistics. Fibre Containers 37, no. 8: 210, 212-14 (August, 1952); *cf.* B.I.P.C. 22: 136.

The principal developments in the fiber-drum industry from January, 1951 to July, 1952 are reviewed, including industry standards and government regulations, the use of large-capacity drums for liquids and semi-

solids, the development of the foil-kraft drum, kraft and wood laminations, drums for explosives and dangerous articles, plastic linings or barriers, and research and laboratory facilities. Statistical data covering the last ten years show a steady increase to 26 million units in 1950, with a slight drop (about 2-3%) in 1951; this is the first year in about 20 years which showed any decline. However, the dollar volume of fiber drums in 1951 is about 10% higher than that of 1950. 1 table, 1 chart, and 2 illustrations. E.S.

SHIPPING CONTAINERS—TESTING

KELLICUTT, K. Q., and LANDT, E. F. Development of design data for corrugated fiberboard shipping containers. Tappi 35, no. 9: 398-402 (September, 1952).

The evolution of a formula for predicting the top-to-bottom compressive strength of corrugated A-, B-, and C-flute boxes from ring-crush or strip-column tests of the component paper sheets is discussed. The application of the formula for use in the design of corrugated fiberboard boxes to meet specific use requirements is shown. The relationship between the static compressive strength of boxes, the dead load of storage, and the duration-of-load are included, as well as a means of interpreting the known compressive strength of a box which has a specific moisture content in terms of another moisture content of the fiberboard. 1 table, 7 figures, and 10 references. E.S.

SLIME PREVENTION

RUDOLFS, WILLEM, and NEMEROW, NELSON L. Effect of alum on slime formation in board mill stock. Tappi 35, no. 9: 410-12 (September, 1952).

Laboratory experiments on the effect of alum on slime formation and the freeness of recirculated white water show that the Al^{+++} is mainly responsible for the retardation and inhibition of slime growth in the absence of free mineral acidity. The adjustment of the stock with acids to pH values of 4.9 has no effect on slime growth or decrease in freeness, but the pH range of 4.0 to 4.9 is somewhat critical, and the acidity present causes slime formers to operate in an environment which is not their optimum. The degree of reduction in slime growth is dependent upon the quantities of alum added. In the presence of about 200 p.p.m. of alum, no slime growth or decrease in freeness occurred. 1 table, 4 figures, and 1 reference. E.S.

STARCH

BLOM, JAKOB, and SCHWARZ, BIRGIT. Types of linkages in starch. Acta Chem. Scand. 6, no. 5: 697-708 (1952). [In German]

The hydrolysis of potato starch with 0.08 *N* hydrochloric acid was followed by changes both in rotation and in reducing values, indicating that, in addition to the 1,4- and 1,6-linkages in starch, glucofuranose 1,5-linkages were also present. In a portion of the starch, glucopyranose and glucofuranose residues appear to alternate so that when β-amylase acts (and forms solely maltose), the fission occurs between C_1 on one unit and C_5 in a neighboring glucose unit. The resulting intermediate compound is stabilized by the formation of maltose. 5 tables and 23 references. L.E.W.

STATIC ELECTRICITY

H. J. S. Ex-static fibers. Ind. Eng. Chem. 44, no. 9: 11A, 13A (September, 1952); *cf.* B.I.P.C. 23: 48.

Reference is made to the difficulties caused by static electricity in the manufacture and applications of synthetic fibers and to efforts for combating them; a list of chemical antistatic agents is included. The problem has not yet been solved satisfactorily. 1 illustration. E.S.

STATISTICAL METHODS

BICKING, CHARLES A., and TRELFA, RICHARD T. Case studies in the application of industrial statistics to papermaking. II. Tappi 35, no. 9: 413-18 (September, 1952); *cf.* B.I.P.C. 22: 49.

Two case studies covering actual applications of statistical techniques to practical papermaking problems are presented. The first case study explains the significance of control chart calculations on paper properties, presents a method for predicting over-all paper variability from these calculations, and outlines a procedure for evaluating the importance of the sources of variability. The second case study presents a general plan for designing an experiment. The general plan is applied to a specific paper mill experiment, and various possible experimental schemes are compared. A statistical appendix is included to give computations and more detailed discussions of some statistical procedures involved in the case studies. 7 tables and 9 references. E.S.

MACAULEY, DONALD. Statistical quality control for the accurate measurement of finished printed results. Am. Ink Maker 30, no. 8: 29-31, 69 (August, 1952).

The possibilities are explained for measuring and controlling printing quality by the statistical control of defects caused by paper, ink, machinery, and plates. A flow chart of printing-department sources of troubles is included. 2 figures. E.S.

STREAM POLLUTION

CAREY, W. GORDON. Sewage, river pollution and trade wastes. Repts. Progress Applied Chem. 36: 88-98 (1951); *cf.* B.I.P.C. 22: 529.

The progress which was made in the more important branches of sewage and trade-waste treatment during 1951 is reviewed. 24 references. E.S.

HOLDERBY, J. M. Industrial waste and stream pollution. Paper Mill News 75, no. 36: 16-17 (Sept. 6, 1952).

Attention is drawn to the difference between pollution arising from industrial wastes which results in oxygen depletion and which is not a health, but a fish problem, and pollution arising from domestic sewage which contributes disease-producing bacteria and which is a health problem, although at times it may also harm fish. The primary objective of true stream conservation should be to preclude health hazards in all streams; the secondary objective should be the avoidance of overloading, beyond their natural recovery capacities, those streams which must be utilized for carrying wastes, whether of public or private origin, and to reduce any existing overloads as rapidly as this can be achieved without disrupting the economic and social structure of the involved area. E.S.

SULFATE MILLS

PAPER TRADE JOURNAL. Brunswick Pulp and Paper latest expansion program. Paper Trade J. 135, no. 12: 128-33 (Sept. 19, 1952); *cf.* B.I.P.C. 22: 424.

The latest expansion program is described; see previous reference. 10 illustrations of the new equipment. E.S.

PAPER TRADE JOURNAL. Riegel Carolina Corp. most modern kraft pulp mill. Paper Trade J. 135, no. 12: 84-6, 88-90, 92-3 (Sept. 19, 1952); *cf.* B.I.P.C. 22: 860.

A profusely illustrated description of the new 200-ton bleached sulfate mill at Acme, N.C. is given. 28 illustrations of the equipment. E.S.

SULFITE WASTE LIQUOR

GILBERT, EVERETT E., and JONES, E. PAUL. Sulfonation and sulfation. Ind. Eng. Chem. 44, no. 9: 2082-100 (September, 1952).

This review on the production of sulfonates during recent years includes a section on lignosulfonates (p. 2093). 413 references. E.S.

JOLLEY, R. S. Burning of sulfite liquor. Pulp & Paper 26, no. 10: 98, 100, 102 (September, 1952).

A report on the experience with evaporation and burning of calcium- and ammonia-base spent sulfite liquors at the Interlake sulfite mill of Consolidated Water Power & Paper Co. at Appleton, Wis. is presented, including methods of initial burning, a new cyclone furnace, and heat and ash problems with calcium-base liquors and experiments with ammonia-base liquors. The entire problem must be assessed economically. The investment cost in the evaporation equipment and the cost of operating it are sufficiently large to offset any possible profit if the desired efficiencies are not maintained throughout. Adding the cost of a new boiler equipment to this investment completely eliminates any possibility of breaking even. However, if the cost of the boiler expansion is charged as a necessary investment to produce increased steam and/or power for pulp- and paper-mill processing, there is some reason to believe that it will become economically feasible. If markets can be found for the concentrated liquor, disposal without burning might prove economical. 1 flowsheet and 1 illustration. E.S.

SULFUR

ANON. Sulphur. Tappi 35, no. 9: 82A, 84A, 86A, 88A (September, 1952); *cf.* B.I.P.C. 22: 947.

This is a somewhat more extensive description of the situation and the estimated free-world production for 1952-55. 2 tables. E.S.

CHEMICAL WEEK. Sulfur shortage nears end. Chem. Week 71, no. 13: 77-8, 80 (Sept. 27, 1952); *cf.* B.I.P.C. 22: 947.

Similar information as in the previous reference is presented. 4 tables. E.S.

VANDOREN, ROBERT H. Sulphur—be realistic. Paper Trade J. 135, no. 11: 37 (Sept. 12, 1952).

With reference to recent optimistic reports concerning the sulfur outlook in the future, the author emphasizes the need for continuing explorations of new fields and constant expansion of production facilities, if demand is to keep up with supply in the years ahead. The new discoveries of the Gulf Sulphur Corp. in its Mexican holdings are listed as a correct step in this direction. E.S.

SYNTHETIC FIBERS

FUNCKE, JULIUS C. The future of chemical fibers. Das Papier 6, no. 17/18: 373-6 (September, 1952). [In German]

The author reviews the trends in the production of synthetic fibers and their possible effects on rayon and acetate. He predicts increasing competition between the cellulosic and fully synthetic fibers in the future, although the possibilities offered by fiber blends with distinct properties (unobtainable by the component fibers alone) will at the same time stimulate the development of each type. 3 tables. E.S.

MARK, H. Influence of molecular structure on properties. Ind. Eng. Chem. 44, no. 9: 2110-14; discussion: 2122-4 (September, 1952).

The author discusses the factors of particular significance for the development of good fiber-forming properties of a polymer, including molecular weight, crystallization, and cross linking. 5 figures and 15 references. E.S.

TALL OIL

JONES, A. LETCHER, and FOREMAN, ROBERT W. Liquid thermal diffusion of tall oil. Ind. Eng. Chem. 44, no. 9: 2249-53 (September, 1952).

A study of the applicability of liquid thermal diffusion to natural fats and oils was undertaken to promote and expand useful applications of thermal diffusion. Tall oil was found to be particularly susceptible to separation by this method. Thermal diffusion was found to concentrate rosin acids in the cold-wall fractions and fatty acids in the hot-wall fraction. When the hot-wall fraction is thermally diffused a second time, a separation of the fatty acids occurs with the more saturated types concentrating in the cold-wall fraction. Unsaponifiables concentrate in the cold-wall fractions. Liquid thermal diffusion is capable of separating the components of complex organic liquids on the basis of molecular configuration differences. The magnitude of the separations obtained indicates the practical application of this relatively unexplored phenomenon to many desirable separations which may be difficult or impossible by conventional methods. 2 tables, 5 figures, and 12 references. E.S.

TANNINS

SNOW, E. A. Oak slabs and cordwood as a source of tannin and pulp. J. Am. Leather Chemists Assoc. 47, no. 8: 563-77 (August, 1952); *cf.* B.I.P.C. 20: 208.

Laboratory and commercial-scale studies initiated by TVA in 1944-45 showed that heavy leather of good quality can be produced with tannin extracted from oak sawmill waste, but that the cost per tan unit was slightly higher than when chestnut wood was used. A pilot-plant study was undertaken at Norris, Tenn. to discover whether separating bark and wood from chipped-oak waste prior to extraction would reduce the cost differential. The advantages of wood-bark separation would be the production of wood suitable for pulping and the extraction of a tannin from the bark at half the cost. The process includes chipping and screening operations followed by separation on a specific-gravity type, air-float separator. Tests of different styles of chippers indicated the V-cylinder, open-style throat, sawmill hog to be most satisfactory for separations by this process. Raw

materials tested included mixed oak slabs, edgings, and cordwood. Chestnut oak was excluded because it is already an accepted source of tannin. Edgings proved inferior to slabs because they could not be chipped satisfactorily. Although the separations on cordwood were not as efficient as on slabs, it is suggested that cordwood could be processed satisfactorily if chipped on a large-diameter hog. Better separation was achieved with air-dried chips than with green ones. The various fractions obtained by separation were recombined according to their bark content into two products: a bark product for tannin extraction and a wood product for pulping. Tests on the bark product showed that it contained sufficient tannin to make its commercial extraction feasible. Heavy leather produced with this extract was of good quality. Pulping tests made on the wood product showed that it would be economically feasible to produce an acceptable quality corrugating board with this material. Estimates from these and earlier tests indicate that slabs can be purchased, chipped, screened, and separated for approximately $8.00 per ton. The processed products from a ton of slabs have an estimated market value of $12.00. In view of these test results and the continued demand for vegetable tannin, use of oak slabs and cordwood as a source of tannin and pulp in the Southeast appears to warrant further consideration. 9 tables, 4 figures, and 16 references. L.C.

TEXTILE INDUSTRY AND FABRICS

GIBBONS, G. C., and HARLAND, W. G. Cellulose textile chemistry. Repts. Progress Applied Chem. 36: 525-45 (1951); *cf.* B.I.P.C. 22: 532.

Two fundamental topics in cellulose chemistry are reviewed with emphasis on the work carried out in these fields during the last decade. The study of the polymolecularity and mechanical properties of cellulose in general, and of cotton and rayon in particular are discussed. Work in cellulose degradation is reviewed with reference to mechanical, hydrolytic, photolytic, and oxidative degradation. 155 references. L.C.

TURPENTINE

PARKER, E. D., and GOLDBLATT, L. A. Acid composition of gum spirits of turpentine and low wines. Ind. Eng. Chem. 44, no. 9: 2211-13 (September, 1952).

Since the acidity of gum spirits of turpentine affects storage quality, a study was made of the acidic components of both the gum turpentine and the low wines (the aqueous phase of the turpentine distillate produced simultaneously), because the kind and amounts of acids present in the low wines undoubtedly affect the acids present in the turpentine. By use of chromatographic procedures the acids separated from low wines were found to consist chiefly of acetic acid (88%), and to contain in lower concentration formic, isobutyric, butyric, propionic, caproic (tentative), and valeric (tentative) acids. The water-insoluble acids from a tail cut of turpentine consist chiefly of resin acids. This acid fraction, however, was found to contain at least four nonresin acids. Three of these have chromatographic properties similar to those of caproic, heptanoic, and caprylic acids. The fourth lies between caprylic and heptanoic acid in adsorption behavior. One of the acids was found to be unsaturated. A knowledge of the acids present in turpentine and in low wines should aid in improving the quality of turpentine and in developing methods for the removal and utilization of these acids. 1 table, 3 diagrams, and 8 references. E.S.

VANILLIN

CHEMICAL WEEK. Vanillin goes by-product. Chem. Week 71, no. 11: 55-6 (Sept. 13, 1952).

Reference is made to expanded production of vanillin from spent sulfite liquor by Monsanto and Ontario Paper Co. in the United States and Canada, respectively, which will end a decade-long shortage of the material. The eugenol and guaiacol processes are gradually being replaced, as more producers switch to the use of spent sulfite liquor. Some of the big producers are searching for possible new markets (chemical intermediates, fungicides, insecticides, etc.) so that, in the future, vanillin may become an important chemical raw material as well as a flavoring agent. E.S.

PEARL, IRWIN A. Reactions of vanillin and its derived compounds. XVI. The synthesis of vanillil. J. Am. Chem. Soc. 74, no. 17: 4260-2 (Sept. 5, 1952); *cf.* B.I.P.C. 22: 950.

Failure to obtain a benzoin condensation with vanillin led to the use of hydrovanilloin (I) as an intermediate for the preparation of vanillil. (I) was prepared in good yield by the electrolytic reduction of vanillin in alkaline solution at a lead cathode. Hydrobenzoins were also prepared from orthovanillin and ethylvanillin in the same manner. Alkaline copper oxidation of (I) yielded only vanillin or its oxidation product, dehydrodivanillin. Oxidation of (I) with cupric hydroxide in glacial acetic acid yielded the desired vanillil in good yield. 1 graph and 8 footnotes. E.S.

PEARL, IRWIN A. Reactions of vanillin and its derived compounds. XX. The reduction of vanillil. J. Am. Chem. Soc. 74, no. 18: 4593-4 (Sept. 20, 1952); *cf.* B.I.P.C. 23: 54.

Vanillil was subjected to the action of a number of reducing agents in an attempt to prepare all of its monomolecular reduction products. In addition to the already known hydrovanilloin, three new vanillil reduction products, namely, vanilloin, desoxyvanilloin and bivanillyl, were prepared in high yield directly from vanillil. 4,4′-Dihydroxy-3,3′-dimethoxystilbene could not be prepared in high yield directly from vanillil by reduction but was easily prepared in good yield by reduction of desoxyvanilloin. 1 figure and 10 footnotes. E.S.

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. XVII. A synthesis of syringaldehyde from vanillin. J. Am. Chem. Soc. 74, no. 17: 4262-3 (Sept. 5, 1952).

Vanillin was brominated to 5-bromovanillin which in turn was hydrolyzed to 5-hydroxyvanillin. 5-Hydroxyvanillin was completely methylated with dimethyl sulfate and alkali, and the resulting 3,4,5-trimethoxybenzaldehyde was partially demethylated by means of sulfuric acid to give a high yield of syringaldehyde. Attempts to methylate 5-hydroxyvanillin to syringaldehyde selectively always yielded the isomeric 5-hydroxyveratraldehyde and the completely methylated 2,4,5-trimethoxybenzaldehyde as by-products. 13 footnotes. E.S.

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. XVIII. Preparation and reactions of lignin model substances related to 5-carboxyvanillic acid. J. Am. Chem. Soc. 74, no. 17: 4263-7 (Sept. 5, 1952).

5-Allylvanillin was isomerized by low temperature caustic fusion to yield 5-propenylvanillin. Ethyl vanillate and ethyl orthovanillate were converted to ethyl 5-allylvanillate and ethyl 5-allylorthovanillate, respectively, and these were treated directly with fused caustic to yield 5-propenylvanillic acid and 5-propenylorthovanillic acid. Oxidation of the propenyl compounds with nitrobenzene and alkali at 160-165° gave the corresponding formyl derivatives as the major products of reaction along with other intermediates. All the formyl derivatives were oxidized by means of alkali and silver oxide to 5-carboxyvanillic acid. 4 graphs and 19 footnotes. E.S.

WASTE

WOODWARD, F. N. Industrial utilization of agricultural wastes. Chemistry & Industry no. 35: 844-8 (Aug. 30, 1952).

Developments in the United States—such as the organization of the National Farm Chemurgic Council and the construction of the four regional laboratories of the Department of Agriculture—and their achievements in different fields (including the use of bagasse, straw, oat hulls, and corncobs) are reviewed and compared with the limited number of developments of this type in the United Kingdom. The possibilities for a better utilization of Commonwealth plant by-products are discussed. 5 tables. E.S.

WASTE PAPER

BECKWITH, WILLIAM H., and BETTENDORF, HARRY J. Waste-paper statistics. Fibre Containers 37, no. 8: 118, 120, 122, 124, 129-30, 132, 134 (August, 1952); *cf.* B.I.P.C. 22: 141-2.

At the beginning of 1951, the demand for waste paper kept rising in the 1950 trend but, by the second quarter of the year, it began to decrease and continued in that direction for the remainder of the year. Nevertheless, a record consumption figure of 9,078,900 tons was reached because of the high demand of the first two quarters. Supply kept well ahead of consumption, with receipts totaling 9,252,000 tons. The importance of quality waste paper to dealers and mills is stressed. With better-quality waste paper and new developments in the mill, waste-paper consumption is expected to settle to a steady increase. Of the 9,078,900 tons consumed in 1951, 76.7% was used for board, 8.5% for roofing, and 14.8% for paper. Raw straw consumption in 1951 was 401,400 tons, a decrease of 4200 tons from the 1950 figure. Numerous tables, diagrams, and pie and block charts. L.C.

WATER AND WATER TREATMENT

HANN, VICTOR. Ozone purification of water. Tappi 35, no. 9: 394-7 (September, 1952).

Advances in ozone technology and the new commercial availability of large-size ozone generators have combined to spur research in industrial ozone applications. An extremely powerful oxidant, unique in that it consists only of oxygen in active form, ozone is finding many new uses in chemical oxidations, in water purification, and in the treatment of industrial wastes. Ozone decomposes to ordinary oxygen in storage and therefore must be generated by the ultimate user at his own plant. Air or oxygen is compressed, dried, and passed through a special type of electrical discharge to form ozone. Ozone has long been used as a germicide in drinking water, particularly in Europe. Recent developments have shown it to be an extremely effective means of removing tastes, odors, and color from water. As a result, large ozone plants to improve water quality have been installed in the municipal water systems of Philadelphia, Paris, and other cities. A new ozone process for the destruc-

tion of phenols in industrial wastes appears to be the most efficient and economical means yet devised for the reduction of phenol concentrations to the very low values required by governmental stream standards. In other industrial waste applications, ozone is being used for the oxidation of mercaptans in liquid wastes and for the treatment of sewage gases to prevent an atmospheric odor nuisance. 6 illustrations and 2 references. E.S.

WAXES

SAYRE, JAMES E., and MARSEL, CHARLES J. The $100 million market for waxes. Chem. Week 71, no. 13: 29-36, 38, 41, 43, 45, 47, 49-50 (Sept. 27, 1952).

An extensive report on the availability, U. S. consumption, consuming industries, producers, and types of waxes (petroleum types, and synthetic, plant, animal and insect, and earth and mineral waxes) is presented. Statistical information is included in tabular form. 10 tables. E.S.

WHITE WATER

RUDOLFS, WILLEM, and AMBERG, HERMAN R. White water treatment. I. Factors affecting anaerobic digestion. Sewage Ind. Wastes 24, no. 9: 1108-1120 (September, 1952).

For reasons of mill economy, conservation of water, and alleviation of stream pollution, increasing importance has been attached to the recirculation of paper mill water for re-use in the mills, and to subsequent treatment of the waste portion to be discharged. Recirculation results in a build-up of the dissolved organic material in the waste and considerable reduction in volume. To determine the feasibility of treatment of this concentrated low-volume waste by digestion and to indicate the effect of various environmental factors (temperature, nutrient additions, and variation of the seeding ratio), batch-digestion experiments were conducted with waste from a paperboard mill utilizing chip board and waste paper, whereas the optimum loadings were determined by digestion of daily charges. For practical purposes, anaerobic digestion for four to five days is effective for the removal of approximately 70 to 80% of the applied B.O.D. load, provided some nitrogen is added and the material is digested at about 30 to 35°C. When higher B.O.D. reductions are desired, longer detention periods are required. 9 tables, 10 figures, and 6 references. E.S.

WOOD—CHEMISTRY

BJÖRKQVIST, K. J., and JØRGENSEN, L. Identification of galactose and rhamnose in birchwood and aspenwood. Acta Chem. Scand. 6, no. 5: 800 (1952). [In English] *cf.* B.I.P.C. 22: 243-4.

Using a milder form of hydrolysis with 0.5 *N* to *N* sulfuric acid than in the past, the authors found galactose units in two species of birch and in an aspenwood to the extent of about 1%. Rhamnose in smaller amounts was also present in these same woods. 8 references. L.E.W.

WOOD—DECAY

GLENNIE, D. W., and SCHWARTZ, H. Pulpwood decay: effect on yield and quality. Paper Ind. 34, no. 6: 738-40 (September, 1952).

A literature review on the effect of decayed pulpwood on the quality and yields of groundwood, sulfite, and soda and sulfate pulps is presented. 2 tables and 19 references. E.S.

WOOD—EXTRACTIVES

CARLSSON, BLENDA, ERDTMAN, H., FRANK, A., and HARVEY, W. E. Chemistry of the natural order *Cupressales*. VIII. Heartwood constituents of *Chamaecyparis nootkatensis*—carvacrol, nootkatin and chamic acid. Acta Chem. Scand. 6, no. 5: 690-6 (1952). [In English] *cf.* B.I.P.C. 22: 445.

Details are given for the isolation of these components. Nootkatin, $C_{15}H_{20}O_2$, melting at 95°, $[\alpha]_D^{20}$ 0°, appears to be a tropolone of the sesquiterpene type. Chamic acid, $C_{20}H_{14}O_2$, is an oil boiling at 142° (8 mm.), $[\alpha]_D^{20} + 257.5°$, which forms characteristic salts and esters. Other acids may also be present in the wood. 17 references. L.E.W.

LINDSTEDT, GÖSTA, and MISIORNY, ALFONS. Constituents of pine heartwood. XXVIII. Constituents of four additional *Pinus* species by paper partition chromatography. Acta Chem. Scand. 6, no. 5: 744-6 (1952). [In English] *cf.* B.I.P.C. 21: 738.

The heartwoods of *Pinus bungeana* Zucc. and *P. gerardiana* Wall. contain stilbenes and flavanones (but no flavones or dibenzyls found in all other pines of the *Haploxylon* subgenus). *P. formosana* Hayata and *P. longifolia* Roxb. have constituents that would be expected from the taxonomic standpoint; however, *P. longifolia* contains no monomethyl ether of pinosylvin. 1 table and 4 references. L.E.W.

WOOD OPERATIONS

WILSON, G. M. Control of costs of slasher mill operation. Pulp Paper Mag. Can. 53, no. 9: 146, 153, 155-6, 158, 160 (August, 1952).

The author describes the methods employed by the Johns-Manville Corporation to control logging costs and thereby achieve maximum production per dollar spent. Time-study engineers studied felling, skidding, and slasher mill operation for efficient methods and equipment. Most efficient use of labor was obtained after a wage-incentive system based on production over standard time production was set up. Time-rating methods are discussed. 5 tables. L.C.

WOOD TRANSPORTATION

ANON. The Meighan raft. Pulp Paper Mag. Can. 53, no. 9: 128, 133 (August, 1952); *cf.* B.I.P.C. 22: 864.

Reference is made to the successful transportation of approximately one million feet of 20-foot cedar logs in a raft consisting of 12 sections of 18 bundles each, held together by swifters and fastenings of the Meighan type, from Prince Rupert, B.C. to the Howe Sound booming ground. The trial raft was en route for 14 days, including two days' rough weather; the towing crew confirmed that it stood up exceptionally well under these conditions. The method seems to be especially well adapted for moving logs through coastal waters, particularly where exposed areas have to be crossed. 2 figures. E.S.

ANON. Pulpwood handling for Chesapeake Corporation. Pulp Paper Mag. Can. 53, no. 9: 149, 151 (August, 1952).

Two new, flat-bottomed, specially designed pulpwood barges of welded-steel construction are described which were built by the Dravo Corp., Pittsburgh, particularly for marine transportation. A brief reference is also made

to the renovated unloading and materials-handling system in the woodyard. 3 illustrations. E.S.

McCRAW, W. E. Build better roads and save. Pulp Paper Mag. Can. 53, no. 9: 142, 144, 146 (August, 1952).

The author reviews the three stages in the construction of hauling roads for wood operations and suggests maximum-efficiency equipment in three categories: power equipment, slow-speed hauling equipment, and high-speed hauling equipment. The use of cost figures to calculate the efficiency advantage *vs.* the overhead for owning and operating the necessary machinery is explained. Cost estimates are made for representative equipment. 6 tables. L.C.

X-RAY RESEARCH

BJØRNHAUG, A., ELLEFSEN, Ø., and TØNNESEN, B. A. Interpretation of x-ray diagrams of unoriented organic chain polymer substances. I. Polyhexamethylene adipamide (nylon-6,6). Norsk Skogind. 6, no. 8: 243-9 (August, 1952). [In English; Norwegian summary]

The radial distribution method for interpreting diffuse x-ray diagrams of liquids employed by Finbak and co-workers (*cf.* Acta Chem. Scand. 3: 1279-308 [1949]) has been used and further developed for the solution of structural problems of unoriented chain polymer substances. Experimental x-ray diagrams of an unoriented nylon sample are interpreted according to this method. 8 figures and 19 references. E.S.

XYLAN

WHISTLER, ROY L., and TU, CHEN-CHUAN. A polymer-homologous series of crystalline oligosaccharide acetates from xylan hydrolysate. J. Am. Chem. Soc. 74, no. 17: 4334-5 (Sept. 5, 1952).

The series of crystalline oligosaccharides from xylobiose to xylohexaose has been converted to the corresponding series of oligosaccharide acetates, all of which are obtained crystalline in the β-D′-configuration. The melting points and specific rotations of these derivates have been correlated with their D.P.'s. These are the first crystalline oligosaccharides to be isolated which are composed solely of pentose-sugar units. The series is of special interest because its members are structurally identical with the corresponding members of the series from cellulose obtained by Dickey and Wolfrom (*cf.* B.I.P.C. 19: 539), except that the xylo-oligosaccharides lack the projecting primary alcohol group on each ring unit characteristic of the gluco-oligosaccharides. 2 tables, 1 diagram, and 8 footnotes. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

CASEY, JAMES P., GILL, LOWELL O., and SHERMAN, ROBERT A. Manufacture of corrugated paperboard. U. S. patent 2,610,136. Filed May 1, 1946. Issued Sept. 9, 1952. 2 claims. Assigned to A. E. Staley Manufacturing Company. [Cl. 154-33.05]

An adhesive for corrugated paperboard consists of an aqueous suspension of partially hydrated starch granules in a nongelatinous aqueous medium. A solution of 2.8 parts of borax and one part of sodium hydroxide in 400 parts of cold water is treated with 100 parts of cornstarch modified on differential rolls and the mixture is allowed to stand about 30 minutes, with occasional stirring to break up small clusters of granules. Swelling of the starch practically ceases within this time and the suspension of partially hydrated granules is then ready for use. In other examples, the starch is stirred with cold water alone, with a solution of aluminum sulfate, or with a water-soluble urea-formaldehyde condensation product. The degree to which the starch swells can be varied by the use of different milling conditions. C.J.W.

FISHER, JACOB I., and BORDEN, GEORGE C., JR. Method of laminating glassine paper. U. S. patent 2,610,939. Filed Dec. 26, 1946. Issued Sept. 16, 1952. 8 claims. Assigned to Riegel Paper Corporation. [Cl. 154-138]

A laminating agent for glassine sheets consists of about 83% of amorphous wax, about 12% of polymerized rosin, about 3% of a heavy viscous liquid polybutene, and about 2% of "butyl" resin; five to ten pounds are used per ream of paper. The agent can be used to laminate glassine to sulfite or to foils or other films. The laminates have improved moisture-vapor permeability and bonding strength. C.J.W.

LAMM, RAYMOND R. Resinous adhesive composition. U. S. patent 2,610,924. Filed May 1, 1948. Issued Sept. 16, 1952. 2 claims. Assigned to The Patent and Licensing Corporation. [Cl. 106-240]

An adhesive for the installation of wall and ceiling coverings, such as acoustical tile, tile board, and the like, consists of limed rosin 26 parts, paraffin wax-naphthalene condensate 8 parts, clay 50 parts, petroleum naphtha 11.5 parts, and water 2 parts. C.J.W.

ASPLUND PROCESS

MAGNUSON, GUNNAR. Defibering presoaked lignocellulose. U. S. patent 2,610,119. Filed Sept. 14, 1946. Issued Sept. 9, 1952. 1 claim. Assigned to Aktiebolaget Defibrator. [Cl. 92-6]

Chips are soaked at room temperature for 4 to 28 hours in an aqueous solution of inorganic pulp reagents (alkali hydroxides, alkali sulfites, acids, or salts). The impregnated chips are digested by the Asplund process, using a steam atmosphere at approximately 150 to 170°C. C.J.W.

BARKERS AND BARKING

BURTON, ROBERT E. Hydraulic log-barker having kerf-cutting and bark-removing jets. U. S. patent 2,611,401. Filed Oct. 17, 1950. Issued Sept. 23, 1952. 2 claims. [Cl. 144-208]

The barker utilizes the combined effect of at least two hydraulic jets, one of which is a leading jet which cuts through the bark and is followed by a peeling jet or jets which serve to peel the cut bark from the wood. Both the cutting and the peeling action are accomplished through the use of relatively low volumes of water in comparison with previous hydraulic methods. As an example, pressures from 3000 to 5000 p.s.i. at a flow rate of from 3 to 5 gallons per minute are used for the cutting jet and pressures of from 1800 to 2500 p.s.i. at a rate of flow of from 9 to 22 gallons per minute for the peeling jet. A log of redwood five feet long and with a diameter of seven inches (inside the bark) was completely peeled in 74 seconds. 5 figures. C.J.W.

EKLUND, HENRIK J., and MILLER, CLARENCE W. Chain-type log barker. U. S. patent 2,608,224. Filed Nov. 28, 1949. Issued Aug. 26, 1952. 9 claims. Assigned to D. J. Murray Manufacturing Co. [Cl. 144-208]

In a chain-type barker, an annular series of alternately oppositely inclined chains is revolvably suspended so that the rotor assemblage will automatically centralize itself relative to the logs as it is brought into active position. The successive chains are maintained taut at all times and are uniformly distortable by both centrifugal force and by the logs to which they are applied. The barker is useful for irregular logs as well as for logs of varying diameters. 9 figures. C.J.W.

EKLUND, HENRIK J., and MILLER, CLARENCE W. Portable log debarker. U. S. patent 2,608,223. Filed Feb. 5, 1949. Issued Aug. 26, 1952. 7 claims. Assigned to D. J. Murray Manufacturing Co. [Cl. 144-208]

The construction of a revolving chain-type of portable debarker is described. It can be used with logs of various diameters and lengths and can be driven by available power sources. 6 figures. C.J.W.

JOHNSON, GEORGE M. Log barking. Canadian patent 486,419. Filed Dec. 30, 1946. Issued Sept. 9, 1952. 4 claims. Assigned to Rayonier Incorporated.

This corresponds to U. S. patent 2,501,848 (March 28, 1950); *cf.* B.I.P.C. 20: 603. High-velocity water jets cut through and remove the bark from the log without removing any of the wood. 7 figures. C.J.W.

BLEACHING

HINSHAW, JERROLD O. Accelerated settling of bleach impurities. U. S. patent 2,610,905. Filed June 9, 1950. Issued Sept. 16, 1952. 4 claims. Assigned to Purex Corporation, Ltd. [Cl. 23-86]

In the preparation of sodium hypochlorite, the chlorination is carried to the point where no appreciable amount of free sodium hydroxide remains in the solution, after which about 0.5% free sodium hydroxide is added; the effect is to cause an accelerated settling of impurities, particularly in the presence of a settling agent, such as magnesium chloride. The normal settling time of 12 hours may be reduced to six hours by this method. C.J.W.

BOARD

SPENCE, OSWALD. Process of making hardboard and the like containing furfuryl alcohol resins. U. S. patent 2,612,445. Filed July 30, 1949. Issued Sept. 30, 1952. 4 claims. Assigned to Masonite Corporation. [Cl. 92-21]

Masonite pulp from hardwood at a consistency of 1 to 10% is treated with a partially condensed water-insoluble furfuryl alcohol resin and the product, after removal of the water, is subjected to heat and pressure to form a board about 0.5 inch in thickness and containing 16 to 20% of resin. This treatment decreases the water absorption, increases the resistance to chemicals, and improves the electrical properties. C.J.W.

BOARD, FIREPROOF

BECHER, HUBERT L. Fire resistant sheet material. U. S. patent 2,611,694. Filed June 27, 1947. Issued Sept. 23, 1952. 6 claims. Assigned to Homasote Company. [Cl. 92-3]

A mixture of 72 pounds of waste paper in 3600 pounds of water, an emulsion containing 9 pounds of chlorinated paraffin (70% chlorine) and 24 pounds of aluminum hydroxide is thoroughly mixed in a pulper, freed of water until the pressed mass has about 50% water (the extracted water is used in the preparation of a new batch), and redispersed in 2895 pounds of a solution prepared by adding 500 pounds of dimethylolurea and 450 pounds of urea to 1945 pounds of water; after thorough agitation, the product is formed into a sheet and dried at 212°F. until the dried product weighs about 150 pounds. Instead of redispersing the intermediate sheet, it may be impregnated with the resin solution. The finished sheet has a density of about 0.6, a tensile strength of 1000 to 1300 p.s.i., a modulus of rupture of 1800 to 1925 p.s.i., a water sorption of 12 to 20% and, in the crib test, ceases to flame or glow in less than 30 seconds with a loss in weight of less than 30%. C.J.W.

BOARD, INSULATING

NUNCIO, ESTELLE M. S. Wallboard containing a phenol formaldehyde resin and cattail fibers. U. S. patent 2,610,160. Filed Feb. 14, 1951. Issued Sept. 9, 1952. 4 claims. [Cl. 260-17.2]

A phenol- or resorcinol-formaldehyde resin (prepared with an alkaline

catalyst) (100 to 175 pounds) and 7 to 18 pounds of an acidic catalyst are mixed at approximately 75°F. for 20 to 30 minutes; this mixture is treated with 200 to 300 pounds of cattail fibers and the whole is agitated about 10 minutes, after which it is poured into molds in a room at about 75 to 80°F. The composition hardens in a relatively short time. The resulting wallboard has a marble-like appearance, is waterproof, and has excellent heat- and sound-insulation properties. C.J.W.

BOARD SPECIALTIES

BOLDING, HUBERT V. Tumbler carrying carton. U. S. patent 2,609,981. Filed April 11, 1950. Issued Sept. 9, 1952. 4 claims. Assigned to The Bradley & Gilbert Company. [Cl. 224-48]

The carton involves dividers for separating the body of the container into individual glass-receiving cells or compartments and a carrying handle composed of two pieces or sections capable of being separated and folded down onto the tops of the glasses to protectively hold the glasses in place. 19 figures. C.J.W.

COLEMAN, WILLITS E., and LEAVITT, JAMES P. H. Paperboard pallet. U. S. patent 2,611,569. Filed March 26, 1948. Issued Sept. 23, 1952. 3 claims. Assigned to Container Corporation of America. [Cl. 248-120]

The construction of a disposable paperboard pallet which can be handled by a fork-lift truck is described. The panel is supported by tubes so arranged that spaces are provided for the application of the truck. 9 figures. C.J.W.

FROST, ORCUTT W., and CONOVER, JAMES H. Concrete form lining material. U. S. patent 2,608,911. Filed May 1, 1946. Issued Sept. 2, 1952. 13 claims. Assigned to United States Gypsum Company. [Cl. 92-40]

A wet mat is formed of pulp to which rosin size and alum have been added; before the mat is dried it is treated with a composition containing 100 parts of furfural (or formaldehyde) and 20 parts of sodium hydroxide in 300 parts of water; 8 parts of a wetting agent may be added, in which case 12 parts of sodium hydroxide are used. Upon drying, the sizing effect in the outer portion of the board is destroyed (generally to the depth of 3/32 of an inch). The concrete or cement will not adhere to the surface of such a board. 2 figures. C.J.W.

HACKMAN, FRANK W., and POOLE, WILLIAM J. Carrier for chimed cans. U. S. patent 2,611,521. Filed Sept. 16, 1949. Issued Sept. 23, 1952. 1 claim. Assigned to Container Corporation of America. [Cl. 224-45]

A retaining flap construction is provided in combination with a carrier or holder for cans which will cause cans to be held securely in the carrier by an inwardly extending retaining flap, even though the can end closures have bulging portions. The chime portion of a can will pass easily over the inwardly extending retaining flap and into the interior of the carrier without catching on the outer portion of the inturned retaining flap. 9 figures. C.J.W.

TOENSMEIER, PATRICK A. Carton. U. S. patent 2,609,137. Filed

Nov. 13, 1950. Issued Sept. 2, 1952. 5 claims. Assigned to Bartgis Brothers Company. [Cl. 229-15]

A bottle carrier or beer carton has a paperboard handle which initially is detachably connected to the partition and lies wholly below the top of the walls with its upper end exposed in a cutout in the partition. When the handle is pulled, it is detached at its original connection and rises to engage the partition at a higher level. When released, the handle can be returned to its original position. 9 figures. C.J.W.

CELLULOSE ETHERS

SWINEHART, RICHARD W., SAVAGE, ALBERT B., and KUHLMAN, WILLIAM D. Method of making methyl carboxymethyl cellulose. Canadian patent 486,361. Filed March 28, 1949. Issued Sept. 9, 1952. 3 claims. Assigned to The Dow Chemical Company.

Details are given of the preparation of methylated carboxymethylcellulose in which cellulose (cotton linters) is saturated with an aqueous solution of sodium chloroacetate and is then heated for 10 hours at 60 to 80°C. with methyl chloride. The resulting product contains 1.45 methoxyl groups and 0.14 carboxymethyl group per anhydroglucose unit. In place of sodium chloroacetate, β-chloropropionic acid can be used. C.J.W.

DISPENSING CONTAINERS

MIRES, JOSEPH E. Dispensing cartons. Canadian patent 486,430. Filed March 4, 1949. Issued Sept. 9, 1952. 4 claims. Assigned to Somerville Limited.

A carton for the packaging of paper cups includes a partition at right angles to the divisional wall or walls for converting the container into a dispenser. 6 figures. C.J.W.

MIRES, JOSEPH E. Dispensing cartons. Canadian patent 486,431. Filed Oct. 28, 1949. Issued Sept. 9, 1952. 2 claims. Assigned to Somerville Limited.

A portion of the top cover of a dispensing carton is formed as a flap and connected over a part of its periphery to the carton by weakened lines which, when broken, permit the flap to be swung back to uncover a dispensing opening; provisions are made to reclose the opening. 5 figures. C.J.W.

REID, GEORGE C., and JACOBS, SAMUEL S. Container with flat top and integral overcap. U. S. patent 2,609,985. Filed May 22, 1947. Issued Sept. 9, 1952. 3 claims. Assigned to American Can Company [Cl. 229-7]

The patent is related to U. S. patent 2,499,416 (March 7, 1950); *cf.* B.I.P.C. 20: 606. It provides for a top for a container for milk, fruit juices, and the like which is substantially flat and smooth and free of places where foreign matter might accumulate and contaminate the contents. The top closure is as strong as the rest of the container and is liquid tight. 9 figures. C.J.W.

DRYING—PAPER

LINDBERG, STEN G. Process of drying paper, board and sheet cellulose and means of applying the same. Canadian patent 486,146.

Filed Dec. 22, 1948. Issued Sept. 2, 1952. 2 claims. Assigned to Aktiebolaget Rosenblads Patenter.

Steam is applied to one surface of the paper web at a velocity sufficiently low to preclude disarrangement of the fibers and to substantially condense at and to penetrate the web as hot condensate while simultaneously applying suction to the opposite surface of the web to remove a substantial portion of the original content (i.e., the original water is replaced by hot condensate); by this means the temperature of the web is raised (in one example from 27 to 47°C.), thus effecting a saving in the steam consumption on the driers (which may amount to 9 to 11%). 3 figures. C.J.W.

FOLDING BOXES

BERGSTEIN, ROBERT M. Lined box structures and method of making them. Canadian patent 485,997. Filed May 3, 1950. Issued Aug. 26, 1952. 8 claims.

A structure combines a boxboard blank and a liner sheet, in which the blank and sheet are of the same or essentially the same size and shape, which are associated together by the employment of the ordinary "cellophane window machines" in current use in the box industry. The resulting container is fully lined. Any flexible material can be used as the liner. The steps in the construction of the box are detailed. 20 figures. C.J.W.

BURGER, MARTIN. Egg carton. U. S. patent 2,608,338. Filed Nov. 21, 1945. Issued Aug. 26, 1952. 7 claims. Assigned to Shellmar Products Corporation. [Cl. 229-28]

A fiberboard egg carton includes a longitudinal partition and a plurality of transverse partitions; each cell has a cushioned bottom supported vertically by downwardly extending projections on the longitudinal partition. 10 figures. C.J.W.

CURRIVAN, JOHN F. Integral carton for protection of fragile articles. U. S. patent 2,611,529. Filed Oct. 27, 1948. Issued Sept. 23, 1952. 9 claims. [Cl. 229-38]

The carton, suitable for fragile articles such as radio tubes, contains a plurality of partitions of different lengths attached to one of the side walls at a common hinge line; the partitions are bent to extend inwardly in the carton and angularly of the side walls and of each other; the free ends of the partitions freely and slidably abut one of the side walls. 10 figures. C.J.W.

FRANKENSTEIN, WILLIAM P. Cartons. Canadian patent 485,931. Filed May 12, 1950. Issued Aug. 19, 1952. 8 claims. Assigned to Patened Packages.

A knocked down carton has a foldable wall which includes an extending flange or edge; means are provided for locking the parts in position to form the base extending flange. 18 figures. C.J.W.

MCREARY, RONALD. Interlocking sections for paper boxes. U. S. patent 2,610,782. Filed Jan. 28, 1950. Issued Sept. 16, 1952. 6 claims. [Cl. 229-33]

A box is provided with interlocking means which will enable the cover section to be locked to and unlocked from the bottom section repeatedly; this means is an integral part of the box. 8 figures. C.J.W.

FOLDING BOXES, SIFTPROOF

WEISS, ARTHUR J. Carton and carton blank. U. S. patent 2,609,138. Filed Dec. 26, 1946. Issued Sept. 2, 1952. 2 claims. Assigned to Robert Gair Company, Inc. [Cl. 229-16]

In the preparation of a siftproof carton, the glue lap is placed at one edge of the blank and adjoining a narrow side panel rather than adjoining a broad side panel; in the case of a container having panels of equal width, the glue lap is formed as an extension of a side panel which adjoins an inner end flap. The side of the inner end flap adjacent the extension of the glue lap has a recess to receive the extension when the end flaps are closed. This avoids the formation of a sifting channel. 8 figures. C.J.W.

INSULATION AND INSULATING MATERIALS

HERITAGE, CLARK C. Manufacture of resin-bound fiber structure. U. S. patent 2,610,138. Filed Nov. 27, 1945. Issued Sept. 9, 1952. 2 claims. Assigned to Wood Conversion Company. [Cl. 154-101]

In the preparation of a fiber blanket, 100 parts of cellulosic fibers are dispersed in a gaseous medium and are treated with fog-like particles of an aqueous alkali-stabilized solution containing about 7% by weight of dissolved phenol-formaldehyde resin-forming solids in an amount to supply from 7 to 25 parts of the resin solids by weight; the resin-covered fibers are formed into a mat and dried to set the resin. An outstanding property of the mat is its resistance to water. The material is suitable as insulation and for protective and cushioning padding. 5 figures. C.J.W.

HONNIG, ROLAND W. Method of molding magnesia insulation material. U. S. patent 2,609,733. Filed Oct. 26, 1945. Issued Sept. 9, 1952. 14 claims. Assigned to Johns-Manville Corporation. [Cl. 92-54]

A magnesia insulation block having densities of 6 to 10 pounds per cubic foot and a modulus of rupture in the range of 25 to 60 p.s.i. is molded directly from a dilute, pre-reacted flocculent slurry of normal magnesium carbonate and asbestos fibers under mechanical pressure in a filter mold while the mold is at least partially immersed in a bath of hot water. The block is given a partial heat curing treatment, preferably while completely immersed in hot water and is then removed from the water and dried to complete its cure. The block structure is free of cracks and gas pockets; its major surface areas bear thereon imprints of the screen linings of the perforated plates which form the major surface areas of the filter mold. 10 figures. C.J.W.

INTERIOR PACKING

BENZON-PETERSEN, BOYE. Cardboard packing. U. S. patent 2,608,339. Filed April 8, 1946. Issued Aug. 26, 1952. 8 claims. Assigned to Aktiebolaget Akerlund & Rausing. [Cl. 229-28]

The subdivision of containers (intended for glassware, china, and the like) into a number of individual cells is effected by means of a sinuous strip of cardboard and a number of parallel supporting strips extending transversely of the wave section of the strip, which serve to support the strip and lock the wave sections in permanent position. 10 figures. C.J.W.

SIDER, NICHOLAS M. Packaging element. U. S. patent 2,609,136.

Filed Sept. 19, 1947. Issued Sept. 2, 1952. 4 claims. Assigned to Container Corporation of America. [Cl. 229-14]

A packing element is formed with a truss construction which prevents deformation. 5 figures. C.J.W.

LIGNIN

POLLAK, ARTHUR. Lignin reinforced rubber and method of making same. U. S. patent 2,608,537. Filed July 12, 1947. Issued Aug. 26, 1952. 53 claims. Assigned to West Virginia Pulp and Paper Company. [Cl. 260-17.5]

A solution is prepared by adding 10 pounds of 50% sodium hydroxide to a slurry of 25 pounds of lignin in 65 pounds of water. Ten pounds of this 25% lignin solution are mixed with 25 pounds of GR-S latex and the mixture is added to 0.8% sulfuric acid at 194°F. The product, containing a coprecipitate of 50 parts of lignin to 100 parts of rubber, is filtered, washed with water, and dried at 160°F. Details are given of the compounding of this material and of the physical properties of the resulting product. The use of this product results in decreased milling time and in a saving in fillers. Various synthetic latices can be employed in place of the GR-S rubber. 13 figures. C.J.W.

RAFF, RUDOLF A. V., and TOMLINSON, GEORGE H., JR. Oxidized alkali lignin as a rubber reinforcing agent. U. S. patent 2,610,954. Filed Feb. 27, 1948. Issued Sept. 16, 1952. 4 claims. Assigned to Howard Smith Paper Mills Limited. [Cl. 260-17.5]

Oxidized alkali lignin having a melting point above 240°C. is used as a reinforcing agent for a butadiene-styrene copolymer latex (GR-S rubber). The alkali lignin (167 pounds) in 900 pounds of a solution containing 18 pounds of sodium peroxide is oxidized for five hours by air at 60 to 70°C. C.J.W.

MACHINERY—BEATERS

HAYES, FRANK. Beater roll. U. S. patent 2,612,083. Filed Sept. 3, 1947. Issued Sept. 30, 1952. 4 claims. Assigned to The Noble & Wood Machine Co. [Cl. 92-22]

The beater roll body is provided with only enough slots to divide the peripheral surface into zones; both roll-bar locking means and spacer are mounted on the roll body and the filling is built up out of individual roll bars and spacers. By this means it is possible to lock each roll bar and spacer to the roll body at a plurality of points along their length and any individual roll bar or spacer can be removed without disturbing the other elements. 4 figures. C.J.W.

HAYES, FRANK. Controlled flow beater. U. S. patent 2,610,553. Filed Feb. 26, 1951. Issued Sept. 16, 1952. 4 claims. Assigned to The Noble & Wood Machine Co. [Cl. 92-22]

The beater roll has a cell spacing of greater than 0.24 and less than 1 inch; means are provided for controlling the flow of the stock to the roll under velocity and in small quantity sufficient only to cover the edges of the bars which define the small cells. Substantially all the stock carried by each cell in the beater roll receives beating treatment during each pass under the beater roll and little or no stock is carried merely for circulation. 5 figures. C.J.W.

MACHINERY—BELTING

HORNBOSTEL, LLOYD. Belt drive for papermaking machines. U. S. patent 2,610,517. Filed March 11, 1946. Issued Sept. 16, 1952. 8 claims. Assigned to Beloit Iron Works. [Cl. 74-242.11]

The invention covers a belt-slack adjusting mechanism characterized by the use of a hydraulic force to maintain a desired tension in the belt independent of the amount of looseness required to be taken up in the particular belt. It also covers a coupling for a belt-driven shaft permitting the replacement or the removal of the shaft from its bearing. 7 figures. C.J.W.

MACHINERY—CHIPPERS

OTTERSLAND, PETER N. Chippers. Canadian patent 486,016. Filed Nov. 22, 1951. Issued Aug. 26, 1952. 2 claims.

This corresponds to U. S. patent 2,585,673 (Feb. 12, 1952); *cf.* B.I.P.C. 22: 541. 1 figure. C.J.W.

MACHINERY—CONVERTING MACHINERY

BASCETTA, ANGELO. Target operated switch for box making machine. Canadian patent 486,086. Filed Jan. 31, 1950. Issued Aug. 26, 1952. 3 claims. Assigned to S&S Corrugated Paper Machinery Co., Inc.

The invention covers a means for closing a single switch which is then opened by the passage of the box blank. This simplifies the electrical circuit and reduces the number of switches. 2 figures. C.J.W.

FARRELL, ROBERT A., and MUELLER, WILLIAM G. Apparatus for sealing containers. U. S. patent 2,609,735. Filed July 18, 1947. Issued Sept. 9, 1952. 7 claims. Assigned to Marathon Corporation. [Cl. 93-39.1]

An apparatus is designed for molding and sealing a thermoplastic or thermoplastic-coated flexible sealing membrane within the opening of a tubular carton and onto its flaps. The inner face of the carton may be treated, if desired, with any suitable type of heat-sealable material. 16 figures. C.J.W.

HESS, CHARLES. Folding machine. U. S. patent 2,608,917. Filed Nov. 20, 1947. Issued Sept. 2, 1952. 2 claims. Assigned to S&S Corrugated Paper Machinery Co., Inc. [Cl. 93-52]

In a carton folding machine a pair of deflecting bars co-operates with folding slats to deflect the side panels upward as the box blank passes through the machine. The mechanism can be used with heavy box blanks made of corrugated board, solid fiberboard, or similar material. 3 figures. C.J.W.

HICKIN, ROBERT J. Carton folding mechanism. U. S. patent 2,608,916. Filed Oct. 4, 1950. Issued Sept. 2, 1952. 9 claims. Assigned to The Ohio Boxboard Company. [Cl. 93-51]

The invention comprises means co-operatively functioning with the folding or setting-up machine and timed in relation to the normal operation of its parts, whereby proper separation and relative folding of the parts of the blanks are insured and proper register of the blanks is reliably accomplished. 10 figures. C.J.W.

MONTGOMERY, HUGH E. Machine for folding paper box blanks on a stack thereof. U. S. patent 2,609,736. Filed June 3, 1948. Issued Sept. 9, 1952. 6 claims. [Cl. 93-49]

The machine is designed to hold a stack of blanks and operates on the topmost blank while it is still in the stack to fold its end portions or flaps over the midportion. The folded blank is then removed from the stack and transferred to a stitcher or to a tape-applying mechanism. Suction cups are applied to the flaps or the end portions of the topmost blank to rock these flaps upward, while the center portion is held down so as to permit the introduction of suitable folding arms under the raised flaps to complete the folding operation. 9 figures. C.J.W.

RICHARDSON, RALPH R., and COY, DON W. Apparatus for setting up paper receptacles. U. S. patent 2,608,139. Filed Sept. 29, 1949. Issued Aug. 26, 1952. 13 claims. Assigned to Chicago Carton Company. [Cl. 93-49]

The mechanism provides means for automatically inserting locking tongues formed in certain walls of the receptacle through slits in other walls thereof; to automatically eject the formed trays; and to feed the blanks to be formed into trays either automatically or by hand. 27 figures. C.J.W.

ROMANO, JOHN A. Method for producing shingle stock. U. S. patent 2,610,555. Filed May 27, 1946. Issued Sept. 16, 1952. 2 claims. [Cl. 92-67]

A machine is described for the production of asbestos-cement stock for shingles. 6 figures. C.J.W.

ROSE, ALFRED G., and PAGE, JAMES. Feeding of collapsed cartons and the like. U. S. patent 2,611,299. Filed Sept. 6, 1950. Issued Sept. 23, 1952. 5 claims. Assigned to Rose Brothers (Gainsborough) Limited. [Cl. 93-53]

A method is described for the feeding of collapsed cartons and the like from a stack to a forwarding device which moves the carton to an operating device (e.g., a forming, filling, and closing apparatus). The suction head is mounted on a rotatable member arranged for intermittent movement about a vertical axis to carry the suction head first to a seizing position adjacent a stationary pack of collapsed cartons standing on their ends, then to a score-breaking position, and then to a delivery position. 3 figures. C.J.W.

ROWE, CARL B. Apparatus for making expanded sheet material. U. S. patent 2,611,298. Filed Jan. 19, 1949. Issued Sept. 23, 1952. 4 claims. Assigned to Research Products Corporation. [Cl. 93-1]

An apparatus for expanding thin flexible material, such as paper, cloth, foil, and the like, slits the material and then stretches it to convert the slits into openings. An improvement in the expanding apparatus insures that the webs are all turned in the same direction. 6 figures. C.J.W.

STEELE, ROGER C. Method of and apparatus for making honeycomb material. U. S. patent 2,610,934. Filed Nov. 22, 1948. Issued Sept. 16, 1952. 13 claims. Assigned to California Reinforced Plastics Company. [Cl. 154-1.8]

The machine has means for applying substantially parallel and uniform glue lines to an elongated sheet and means to lap into superposed layers to

form a stack of layers which may be sliced into smaller pieces and expanded to form a honeycomb structure which is characterized by its uniformity in cell size and shape. 7 figures. C.J.W.

WILLIAMS, VICTOR G. Machinery for fabricating bags in various sizes. U. S. patent 2,611,225. Filed Dec. 30, 1948. Issued Sept. 23, 1952. 4 claims. Assigned to Delamere & Williams Company, Limited. [Cl. 53-88]

A machine is provided with simple adjustable means by which bags can be made in a relatively large variety of sizes; this is accomplished by varying the spacing between successive seals. The machine has a regulatable mechanism for controlling the action of the transverse sealing element to permit the passage of a predetermined length of bag material before operating thereon. 10 figures. C.J.W.

WORTH, FRANCIS C. Device for making tubes from sheet material. U. S. patent 2,610,556. Filed Aug. 25, 1950. Issued Sept. 16, 1952. 16 claims. [Cl. 93-77]

The machine is designed to apply labels to various articles such as flexible or rigid containers, balls of thread, and the like. 17 figures. C.J.W.

MACHINERY—CUTTERS

BUTLER, JOSEPH F. Cutting apparatus for wallboards and the like. U. S. patent 2,611,179. Filed May 2, 1946. Issued Sept. 23, 1952. 2 claims. [Cl. 30-287]

In an apparatus for cutting and scoring plaster board, gypsum board, and like material, the cutting implement must pass over the end of the sheet to be cut so that it can be drawn across a straight line from edge to edge. The cutting device is mounted on a frame in a manner to mount the sheets to be cut on a suitable support, and the cutting implement is drawn through a guide mounted adjacent the support. 9 figures. C.J.W.

MACHINERY—EMBOSSING MACHINERY

ILLNER, PAUL R. Embossing calender. U. S. patent 2,611,312. Filed Oct. 17, 1946. Issued Sept. 23, 1952. 2 claims. Assigned to The Champion Paper and Fibre Company. [Cl. 101-23]

An embossing calender, which will emboss a paper web on both sides in a single pass through the rolls, has an engraved pattern on the surface of each of two metallic rolls; these rolls contact only yielding-surfaced rolls and are separated from each other by an even number of rolls, the diameter of the lower of the engraved rolls being not less than two times that of the other engraved roll. The driving power must be applied either to the engraved roll embossing the second side or nearer to that roll than to the engraved roll embossing the first side. The prominence of the embossing on the second side (relative to that on the first side) can be changed by varying the pressure. 1 figure. C.J.W.

MACHINERY—HEAD BOX

DAVIS, HAROLD M. Apparatus for producing paper. U. S. patent 2,608,912. Filed Feb. 23, 1949. Issued Sept. 2, 1952. 13 claims. Assigned to Precision Paper, Inc. [Cl. 92-44]

The invention relates to a method of and means for controlling the flow

and character of the pulp stream as it leaves the headbox and is deposited upon the screen. This is accomplished by the use of a plurality of baffles in the headbox with means for supporting them in close proximity to a bottom portion of the box. There is an interesting discussion of heavy and light streaks (hills and valleys) in the paper web and of a method of sampling to determine the true character of the profile of the web. 23 figures. C.J.W.

MACHINERY—JORDANS

STUCK, HAROLD D. Jordan engine plug construction. U. S. patent 2,610,554. Filed Dec. 17, 1947. Issued Sept. 16, 1952. 3 claims. Assigned to John W. Bolton & Sons, Inc. [Cl. 92-27]

This corresponds to Canadian patent 474,762 (June 26, 1951); *cf.* B.I.P.C. 21: 893. C.J.W.

MACHINERY—PASTING MACHINE

PASOTTI, FELICE G. Glue-spotting apparatus. U. S. patent 2,608,949. Filed Nov. 28, 1947. Issued Sept. 2, 1952. 8 claims. Assigned to Ball Brothers Company. [Cl. 118-8]

In a glue-spotting apparatus for cartons, the articles to be spotted are moved at a predetermined rate up to the glue-spotting position and are then moved away from this position at an increased rate of travel. The apparatus is designed to apply a minimum of glue to each surface but to so distribute it, that it is effectively employed in holding the cartons in assembled relationship and at the same time contributes to an easy separation of the individual carton from the shipping assembly without destroying the surfaces for advertising or similar purposes. 9 figures. C.J.W.

MACHINERY—SCREENS

MCCRYSTLE, JOHN. Screening of fibrous material. U. S. patent 2,608,910. Filed April 26, 1946. Issued Sept. 2, 1952. 5 claims. [Cl. 92-20]

In the operation of a flat screen with a pulp consistency of 0.5 to 2%, positive jet streams of water under pressure are introduced at an angle of less than 75° to the plane of the screen; the water is so introduced that the entire operating areas of the screen are directly subjected to its action. The method is said to increase the production rate of the screen and to decrease the quantity of rejects. 2 figures. C.J.W.

MACHINERY—SLITTERS AND WINDERS

ASMUSSEN, JES, and GRUPER, FRANK. Winding apparatus. U. S. patent 2,609,157. Filed Nov. 12, 1947. Issued Sept. 2, 1952. 3 claims. Assigned to Marathon Corporation. [Cl. 242-66]

Automatic means are provided for controlling the pressure and tension upon the web by compensating for the normal increase in pressure and tension upon the web as it is being wound onto the winder shaft. The mechanism permits a simple adjustment for webs of different weight or density. 8 figures. C.J.W.

MACHINERY—SUCTION BOXES

BRATTON, SAMUEL M. Suction box connection to manifold. U. S. patent 2,608,913. Filed Oct. 15, 1946. Issued Sept. 2, 1952. 17 claims. Assigned to The Pusey & Jones Corporation. [Cl. 92-51]

The invention provides, in combination with a vertically adjustable Fourdrinier machine having suction boxes carried by the supporting rail thereof, a fixed manifold connected to the suction and discharge lines and a vertically adjustable connection, including a vertically slidable joint, between a coupling conduit section. The suction box may be reciprocated and the coupling unit may remain relatively stationary. The method facilitates the removal of one suction box and the substitution of another. 7 figures. C.J.W.

MACHINERY—VATS

BREYFOGLE, ROY H. Cylinder papermaking machine. U. S. patent 2,609,732. Filed March 14, 1946. Issued Sept. 9, 1952. 2 claims. Assigned to Alton Box Board Company. [Cl. 92-43]

A cylinder machine is provided with means for introducing white water or other diluting liquor into the vat circle of the machine; the quantity of liquid is such as to maintain constant stock consistency throughout the entire vat circle. This aids in maintaining uniform web formation. 1 figure. C.J.W.

MATERIALS HANDLING

SIMONTON, BUDD E. Bag package with fork-lift handling means. U. S. patent 2,609,923. Filed Oct. 27, 1949. Issued Sept. 9, 1952. 3 claims. Assigned to St. Regis Paper Company. [Cl. 206-60]

A method of packing loads of sheet materials and particularly multiwall bags for shipment employs a pair of hollow tubular core members in substantially parallel relationship which permits handling with a fork-lift truck without the use of a pallet. 3 figures. C.J.W.

MOLDED PULP ARTICLES

CHEVRIER, EUGENE M. Method of pressing blanks of molded pulp. U. S. patent 2,611,154. Filed Sept. 13, 1949. Issued Sept. 23, 1952. 3 claims. [Cl. 18-56]

A method is claimed for the surface pressing of blanks of molded pulp (preferably containing a certain amount of thermoplastic or thermosetting material) with the application of heat (about 120°C.) to form a cylindrical container; it is especially suitable for forming ribs or beads in the bottom wall of the container. 7 figures. C.J.W.

PACKAGING

CONKLE, GORDON A. Two-lamp wrapper. U. S. patent 2,611,531. Filed Feb. 25, 1949. Issued Sept. 23, 1952. 4 claims. Assigned to General Electric Company. [Cl. 229-90]

The object of the invention is to provide a lamp wrapper in the form of a sleeve for holding and protecting a pair of incandescent lamps. 3 figures. C.J.W.

PACKAGING—OPENERS

ECKMAN, GEORGE E. Fiber container with improved tearing strip. U. S. patent 2,608,341. Filed Oct. 20, 1947. Issued Aug. 26, 1952. 1 claim. Assigned to American Can Company. [Cl. 229-51]

A fibrous container for frozen foods and the like has a tearing strip which is defined by score lines arranged on both sides of the material of the body

of the container to facilitate splitting of the material between the score lines when the tearing strip is removed. 7 figures. C.J.W.

PAPER FINISH

SOOY, BRAINARD E., and FISHER, HARRY C. Method of calendering mineral coated paper. U. S. patent 2,611,717. Filed Jan. 22, 1949. Issued Sept. 23, 1952. 2 claims. Assignors to The Gardner Board and Carton Co. [Cl. 117-64; changed to 117-65]

Paper webs coated with a mineral substance and a water-soluble adhesive are passed through a calender roll and treated, while on the rolls, with an aqueous solution of gelled starch having a solids content of 4.5 to 15% by weight. The temperature of the solution is about 140°F. The coated surface is harder, smoother, and glossier than a surface without this treatment. The nonadhesive quality of the starch solution may be improved by the addition of about a gallon of wax dispersion (50% wax content) to 100 gallons of the starch; other modifiers include alginic materials, locust-bean gum, guar, and slippery elm. 1 figure. C.J.W.

PAPER SPECIALTIES

CARLSON, ARTHUR E. Reinforced paper article. U. S. patent 2,610,936. Filed Aug. 10, 1949. Issued Sept. 16, 1952. 17 claims. [Cl. 154-53.5]

A reinforced paper article consists of a single ply of paper and a plurality of reinforcing elements of rayon, nylon, or other untwisted synthetic material secured to one face thereof, the reinforcing elements consisting of the multiplicity of fine continuous untwisted filaments disposed in substantially parallel relation in a thin compact ribbon; the adhesive is a synthetic resin or a latex-base product. The product can be used as a wrapping material, in the manufacture of bags, and as stay tapes. 8 figures. C.J.W.

FINLAY, WALTER L., and ADESSA, DOROTHY R. Shot shell manufacture. U. S. patent 2,608,140. Filed Feb. 15, 1947. Issued Aug. 26, 1952. 2 claims. Assigned to Remington Arms Company, Inc. [Cl. 93-83]

In the manufacture of tubes for shot shell bodies from Fourdrinier kraft paper, the paper is wound and adhesively secured into tubes of a diameter not less than 5% greater than the desired finished diameter, the tubes are humidified to a moisture content determined by the transverse elongation of the paper but not less than 7% or more than 18%, and the humified tubes are compressed to reduce the diameter by not less than 4.5%. The method avoids the use of a specially prepared paper. 2 figures. C.J.W.

HENRY, BEULAH L. Continuously attached envelopes. U. S. patent 2,610,784. Filed Oct. 18, 1949. Issued Sept. 16, 1952. 4 claims. [Cl. 229-69]

The invention relates to a series of envelopes which are connected together in strip formation to permit feeding through a typewriter or addressograph. Adjacent envelopes are integrally connected together by narrow tabs located adjacent the opposite ends thereof; these may be severed for separating the envelopes. 8 figures. C.J.W.

HOPKINSON, HARRY. Flameproofing composition. U. S. patent 2,610,920. Filed Nov. 1, 1948. Issued Sept. 16, 1952. 7 claims. [Cl. 106-15]

A flameproofing composition for textiles, paper, artificial leather, or the like consists of a chlorinated organic material which releases hydrochloric acid when heated, a metallic oxide (or a mixture of such oxides) capable of reacting with the acid in the presence of cellulose at combustion temperatures higher than those at which the hydrochloric acid is normally liberated by the chlorinated material, an inhibitor adapted to retard the release of the acid, and a water-insoluble glowproofing material. An example is: 200 parts toluene, 50 parts chlorinated rubber, 40 parts 70% chlorinated paraffin, 195 parts 42% chlorinated paraffin, and 230 parts of a powder (containing 70 parts of zinc oxide, 33 parts of magnesium oxide, 36 parts of lead monoxide, 36 parts of basic lead carbonate, and 45 parts of rosin amine phosphate. Various other examples are given. C.J.W.

KELLER, RAY B., and DAWSON, HARROLD B. Duplicating method. U. S. patent 2,611,313. Filed Dec. 10, 1946. Issued Sept. 23, 1952. 2 claims. Assigned to Hammermill Paper Company. [Cl. 101-149.4]

The master sheet consists of a base sheet of paper, regenerated cellulose, glassine, metal foil, or the like which carries a coating of any suitable duplicating material and a protective coating of a waxy material. In an example, the base sheet is coated with a mixture of dye and wax which, in turn, is coated with a carbon tetrachloride solution containing 8% of a cumarone indene resin and 1% of a plasticizer (such as Herculyn). The coating is dried below the melting point of the wax-dye combination. The plasticized resin of the protective layer is stable at room temperature and is entirely free from any tendency to smudge or stain surfaces with which it may come into contact. The product is useful in salesmen's order books or the like or it may be used in any of the spirit-duplicating systems. 6 figures. C.J.W.

MEYER, FRANK J. Method of making adhesive tapes and adhesive units. U. S. patent 2,608,503. Filed Sept. 16, 1950. Issued Aug. 26, 1952. 12 claims. [Cl. 154-118]

An adhesive tape of paper, coated on both sides or impregnated with a normally tacky, pressure-sensitive adhesive, is provided with a liner strip of Holland cloth, polyethylene, or other material sized, coated, or treated to prevent permanent adherence to the adhesive. The method of manufacture is claimed. 6 figures. C.J.W.

PHYSICAL TESTING—PAPER—PRINTABILITY

VANDERCOOK, DAVID D., VANDERCOOK, EDWARD O., and PELLAND, RAYMOND L. Multicolor proof press. U. S. patent 2,610,581. Filed March 22, 1947. Issued Sept. 16, 1952. 14 claims. Assigned to Vandercook & Sons, Inc. [Cl. 101-208]

In a proof press for testing the suitability of paper for multicolor printing, a set of printing forms is disposed in spaced relationship along a horizontal bed and a carriage is reciprocably moveable over such bed and carries an impression cylinder to which a proof sheet is attached. The inking of the individual forms and the speed of the impression cylinder with respect to such forms are accomplished in such a manner as to provide printing conditions equivalent to those of production presses. The various components are fully described. 20 figures. C.J.W.

PLASTIC FILMS (NONCELLULOSIC)

PLAGGE, HOMER H. Package and storage of apples. U. S. patent 2,611,709. Filed May 14, 1949. Issued Sept. 23, 1952. 1 claim. Assigned one-half to Iowa State College Research Foundation, Inc., and one-half to The Goodyear Tire & Rubber Company. [Cl. 99-171]

A basket, crate, or barrel is provided with a tight liner of rubber hydrochloride film not more than 0.0012 inch in thickness; the liner contains 15 parts of methoxyethyl oleate and 15 parts of dibutyl sebacate per 100 parts of rubber hydrochloride. The carbon dioxide permeability of such films is reported for films of varying thicknesses. 1 figure. C.J.W.

ROOFING FELTS

GREIDER, HAROLD W., and FASOLD, GEORGE A. Mineralized bituminous roofing. U. S. patent 2,610,928. Filed Aug. 7, 1943. Issued Sept. 16, 1952. 2 claims. Assigned to The Philip Carey Manufacturing Company. [Cl. 117-168]

The roofing felt is coated with an asphalt with a softening point of 200 to 210°F (32%) and a filler composed of 47% of powdered limestone and 21% of asbestos dust. The product has a high fire and high blister resistance. 25 figures. C.J.W.

SETUP BOXES

METZGER, HENRY L. Box. U. S. patent 2,610,781. Filed Jan. 7, 1948. Issued Sept. 16, 1952. [Cl. 229-16; changed to 229-18]

In the preparation of containers for cheese, the blank is so formed that, when folded, the finished side of the blank will be on the outer side of the box. When folded to form the box, certain portions of the blank are interlocked or interfitted in a manner which will hold the various portions in box-formed relation. 11 figures. C.J.W.

SHIPPING CONTAINERS

BEST, WILSON F. Straight sided stacking tote or packing box. U. S. patent 2,610,756. Filed April 7, 1950. Issued Sept. 16, 1952. 5 claims. [Cl. 220-4]

A straight-sided stacking box, suitable for handling baked goods and other merchandise, is formed of a metal bottom and fiberboard end and side walls. 3 figures. C.J.W.

DONNELL, JOHN S. Container. U. S. patent 2,608,340. Filed July 28, 1949. Issued Aug. 26, 1952. 1 claim. Assigned to Florida Fibre Box Company. [Cl. 229-33]

The construction of a shipping container for fruits and vegetables is described; formed of double-faced corrugated board, it has single-thickness end walls and double-thickness side walls. It is so constructed that it may also be used as a display package. 6 figures. C.J.W.

FISHER, JOHN V. Portable display carton. U. S. patent 2,611,527. Filed Jan. 16, 1950. Issued Sept. 23, 1952. 4 claims. [Cl. 229-16]

A container for canned goods and the like which is suitable as a carry-home

item is provided with partially open sides and has one or more tray-like container-retaining bottom or top portions which serve to retain a set of cans in the carton while permitting viewing of the labels thereon. Two overlapping end panels are provided which are glued together and are provided with finger grips. 2 figures. C.J.W.

GEORGE, WALTER C. Heavy-duty shipping container. U. S. patent 2,611,526. Filed Oct. 20, 1950. Issued Sept. 23, 1952. 2 claims. Assigned to Gaylord Container Corporation. [Cl. 229-14]

A relatively tall, heavy-duty container for the shipment of rayon yarn wound on cones consists of two piles of paperboard and flush exterior faces throughout, the inner ply being provided with an access opening that permits packing of the entire container and which is completely enclosed by a sleeve which is snugly telescoped thereover after or near the completion of the packing operation. 7 figures. C.J.W.

GEORGE, WALTER C. Shipping carton with handle reinforcing and flap securing clip. U. S. patent 2,611,530. Filed Oct. 1, 1948. Issued Sept. 23, 1952. 3 claims. Assigned to Gaylord Container Corporation. [Cl. 229-52]

Bottle shipping cartons have clips that embrace the upper margins of the hand holes in the end walls and the lower margins of the downturned upper marginal flaps of the latter and means for securing the clips in place. 8 figures. C.J.W.

MCKENZIE, DENNIS I. Container. U. S. patent 2,609,135. Filed Feb. 17, 1948. Issued Sept. 2, 1952. 7 claims. Assigned to Moraine Box Company. [Cl. 229-14]

The invention provides a wooden crate type of reinforcement structure to be placed within a cardboard container which holds the structure together and is arranged in such manner that metal straps can be placed around the carton to bind the parts of the reinforcement structure together. By this method a cardboard carton can be inserted over an assembled crate and the whole can be turned over completely to permit folding of the flaps over the open side of the carton. 6 figures. C.J.W.

OCHAR, THOMAS. Self-locking box. U. S. patent 2,610,783. Filed Nov. 9, 1950. Issued Sept. 16, 1952. 2 claims. [Cl. 229-45]

The locking lugs are formed from end flaps folded back upon themselves so as to provide a double thickness; in some cases the flap may be secured to an adjacent panel, thus providing a lug of only single thickness. The box is so constructed that it may be filled with compressible material and the cover applied to hold the material under compression. 6 figures. C.J.W.

SHIRLEY, FREDERICK J. Wrappers or containers of cardboard or like material. Canadian patent 485,831. Filed Nov. 1, 1949. Issued Aug. 19, 1952. 6 claims.

Wrappers or containers of cardboard and the like consist of sheets which are spaced apart, being either separate sheets or a folded sheet, which are to be secured together and closed at their ends. The product is suitable for use as a book wrap. 11 figures. C.J.W.

VADNER, SAMUEL. Container. U. S. patent 2,611,528. Filed Aug. 1, 1950. Issued Sept. 23, 1952. 6 claims. [Cl. 229-23]

A container is proposed which has high resistance to the stresses and strains imposed by relatively heavy supported loads. It also has resistance to tear in the vicinity of the upper corners. Opposed cover pieces are attached to one pair of the walls and cross brace flaps are attached to the pair of walls; these flaps have contours corresponding to the contours of the adjacent side flanges and edges abutting the adjacent walls of the container. 6 figures. C.J.W.

SULFUR DIOXIDE

LEWIS, WARREN K. Production of sulfur dioxide. U. S. patent 2,608,467. Filed Dec. 22, 1948. Issued Aug. 26, 1952. 7 claims. Assigned to Standard Oil Development Company. [Cl. 23-179]

Pure sulfur dioxide free of oxygen and sulfur contaminants can be continuously prepared by burning sulfur, hydrogen sulfide, or sulfur-containing ores and passing the gases through a purification zone containing a mixture of iron oxides (50% of Fe_2O_3 and 50% Fe_3O_4). The combustion should be carried out with a controlled quantity of air, depending on the state of oxidation of the material being burned. A flowsheet of the operation is given. C.J.W.

TALL OIL

BARTH, ROBERT H. Tackifiers and softeners for synthetic rubbers and compositions containing the same. U. S. patent 2,611,752. Filed July 21, 1950. Issued Sept. 23, 1952. 18 claims. Assigned to Heyden Chemical Corporation. [Cl. 260-27; changed to 260-23.7]

A tackifier for synthetic rubber compositions is exemplified by pentaerythritol diabietate butyral, which is the reaction production of two moles of abietic acid, one mole of pentaerythritol, and one mole of butyraldehyde. A similar product is obtained by heating 170 parts of tall oil (Trostol) with 748 parts of the mixture of partial formals of pentaerythritol (obtained as a by-product in the manufacture of pentaerythritol by the condensation of formaldehyde and acetaldehyde with an alkaline catalyst) for two hours at 275°C.; after cooling to 100°C., the product is mixed with excess butyraldehyde and five parts of concentrated hydrochloric acid and refluxed four hours. The claims cover only the tall oil esters. 3 tables. C.J.W.

ESPOSITO, VITO. Process for treating tall oil with alkylene oxides. U. S. patent 2,610,966. Filed Oct. 17, 1949. Issued Sept. 16, 1952. 9 claims. Assigned to R. M. Hollingshead Corporation. [Cl. 260-97.5]

A tall oil is used which has been purified by heating 100 parts with one part of maleic acid at 260°F. for about 90 minutes. The purified product (284 parts) is treated at 400°F. with ethylene oxide under a pressure of 2200 p.s.i. until about 353 parts of the oxide have been introduced; the temperature is then raised to 600°F. and a further 353 parts of the oxide are introduced under a pressure of about 3000 p.s.i. The cooled product is treated with charcoal and the clear filtrate is heated to about 150°F. to remove excess oxide. The resulting product is suitable for use in hydraulic fluid compositions (*cf.* U. S. patent 2,588,970; B.I.P.C. 22: 644). C.J.W.

TEXTILE INDUSTRY AND FABRICS—TESTING

LA TORRE, RICHARD R., and GEORGE, THOMAS W. Mount for tensile testing specimens of textile material. U. S. patent 2,608,857. Filed Aug. 12, 1949. Issued Sept. 2, 1952. 4 claims. [Cl. 73-103]

A mounting head for a tensile tester is so constructed that all parts of the specimen under stress are maintained in precise axial alignment with the direction of stress application. By its use the scatter of tensile test results may be reduced by 25 to 40%. 1 figure. C.J.W.

WASTE LIQUOR

MANNBRO, NILS V. Methods of recovering hydrogen sulfide from sulfide containing soda liquors obtained in cellulose production. U. S. patent 2,611,682. Filed Dec. 4, 1950. Issued Sept. 23, 1952. 4 claims [Cl. 23-181]

Hydrogen sulfide is recovered from the smelt containing sodium sulfide and sodium carbonate by passing a solution of the smelt and carbon dioxide-containing gas in counterflow through an absorption tower. The gas rate is so adjusted that practically all the carbon dioxide introduced is absorbed in the tower but no hydrogen sulfide is expelled; the hydrogen sulfide present in the soda liquor removed from the bottom of the tower may be recovered by introducing the liquor into a vacuum chamber. The process is applicable to spent liquors from the semichemical process, to black liquor which has been freed of lignin by sulfur dioxide, and to spent sulfite liquor which has been used in the sulfate process. C.J.W.

WOOD—EXTRACTIVES

HEARON, WILLIAM M., and JONES, VIRON V. Thermal process for beta conidendrin manufacture. U. S. patent 2,610,970. Filed Sept. 16, 1950. Issued Sept. 16, 1952. 8 claims. Assigned to Crown Zellerbach Corporation. [Cl. 260-344.6]

Conidendrin (m. 250-255°C.), heated at a temperature of 260 to 360°C. for 2 to 150 minutes (the time of heating decreases with increase in temperature) or treated with superheated steam (275 to 400°C.) in the molten state, gives a quantitative yield of beta-conidendrin (m. 203-208°C.). 1 diagram. C.J.W.

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